APPENDIX I

10. NET INTERFACE COMPUTER PROGRAM (NICP) INTERFACE

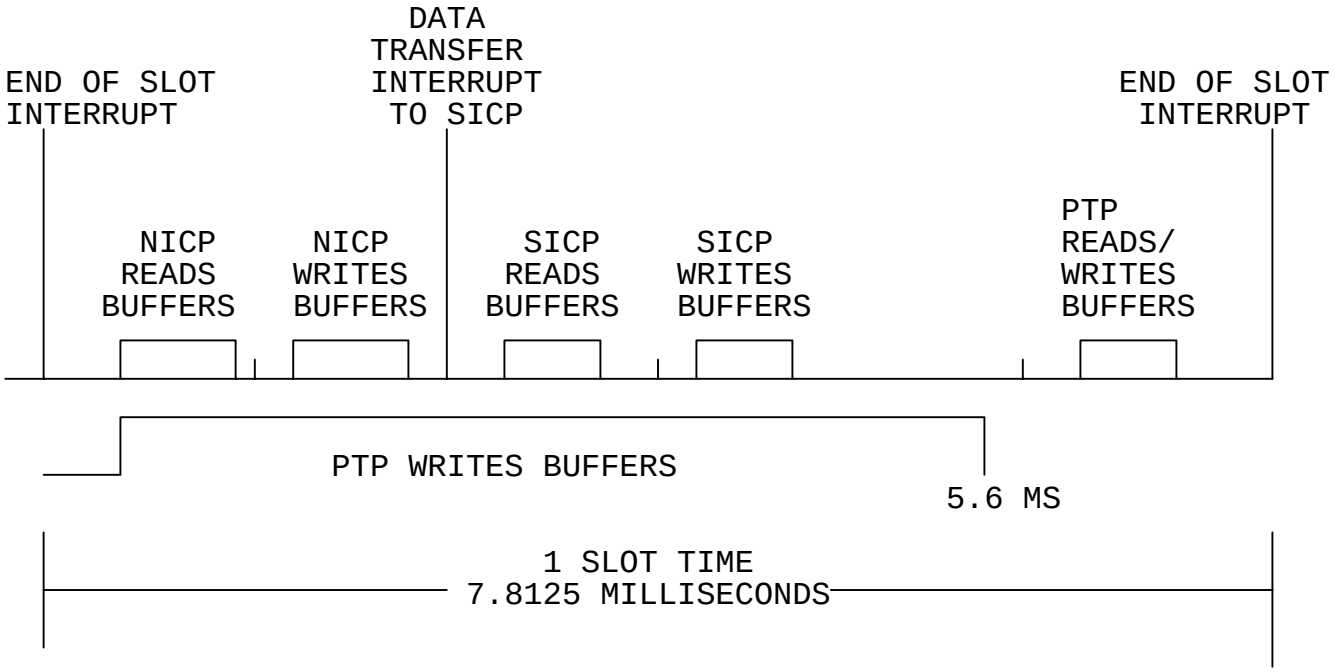
10.1 SCOPE. This appendix details the NICP interfaces.

10.1.1 Net Interface Computer Program. The NICP shall interface with the DDP, PTP and the Subscriber Interface Computer Program (SICP) located in the interface unit via Global Memory. The general procedure for interfacing with the PTP and the SICP (refer to Figure I-1) will be that data transfer will occur in response to an end of slot interrupt signal from the DDP. The NICP will then read the input data from both the PTP and the SICP and perform the necessary processing to formulate the required outputs. When the output has been prepared for the SICP, the NICP shall issue an input/output (I/O) instruction to command the DDP to output a data transfer interrupt to the SICP to synchronize the data transfer. If there is no data to be transferred to the SICP, the Data Transfer interrupt will be issued to allow the SICP to send data to the NICP.

10.1.1.1 NICP/PTP Data Transfer. The NICP shall write the following group of PTP housekeeping words into Global Memory every slot time prior to 5.6 milliseconds after receipt of the end of slot interrupt. The PTP shall read these words between 5.6 and 7.8 milliseconds after the end of slot interrupt.

WORD	FUNCTION
1	VARIABLE FOR SLOT N+1
2	VARIABLE FOR SLOT N
3	TOD FOR SLOT N WORD 1
4	TOD FOR SLOT N WORD 2
5	TOD FOR SLOT N WORD 3
6	TOD FOR SLOT N+1 WORD 1
7	TOD FOR SLOT N+1 WORD 2
8	TOD FOR SLOT N+1 WORD 3
9	MESSAGE TYPE (HEADER OF MESSAGE)
10	STN (MESSAGE)
11	MESSAGE TYPE (TRANSMIT CONTROL)
12	SLOT TYPE (N+1)

NICP-TO-PTP DTB



NOTE: TIMING NOT TO SCALE

FIGURE I-I. NICP/PTP/SICP DATA TRANSFER TIMING DIAGRAM

WORD	FUNCTION
13	TOA ADJUSTMENT ANTENNA A
14	TOA ADJUSTMENT ANTENNA B
15	TOA ADJUSTMENT SUM
16	RECEIVER THRESHOLD (DATA)
17	RECEIVER THRESHOLD (MINI SYNC-FULL)
18	TIME QUALITY
19	STN (RTT-A)
20	TN ADDRESSEE
21	R/T WORD 1
22	R/T WORD 2
23	R/T WORD 3
24	R/T WORD 4
25	R/T WORD 5
26	R/T WORD 6
27	TRANSMIT TIME WORD 1
28	TRANSMIT TIME WORD 2
29	RECEIVE BUFFER ADDRESS
30	TRANSMIT BUFFER ADDRESS
31	TIME CORRECTION WORD
32	VARIABLES FOR ZEROING
33	SPARE
34	SPARE
35	SPARE

The listed words shall be stored in contiguous locations in Global Memory. The starting location shall be 0040_{16}. The format of these housekeeping words shall be as specified in 10.1.1.1.1.

All bits labeled "not used" shall be set to logic 0.

10.1.1.1.1 NICP Output Words to PTP.

10.1.1.1.1.1 Variable for Slot N+1 Word. The Variable for Slot N+1 word shall be provided by the NICP every slot time and shall be used by the PTP for commanding what variables are to be used for slot N+1 (see Figure I-II). The variable for slot N+1 word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0040_{16}
SMT	RESET	FSA	CSC	ALMCK	TRANSEC VAR			OTAR	NTR	P/C	MID	ERV	ENCRYPT VAR			

The bit designation shall be as follows:

BIT	DESIGNATION
0-2	VARIABLE NUMBER FOR ENCRYPT (0-7)
3	ERASE VARIABLES (ERV) LOGIC 1 = ERASE VARIABLES INDICATED IN VARIABLES FOR ZEROING WORD (10.1.1.1.1.25)
4	MIDNIGHT (MID) THIS BIT SHALL NORMALLY BE SET TO A LOGIC 0 EXCEPT FOR THE FOLLOWING CONDITION: IF THE PRESENT SLOT (N) IS THE LAST SLOT OF THE DAY (112/16383/C), THEN THE MID BIT SHALL BE SET TO A LOGIC 1. IN ALL OTHER SLOTS THE MID BIT SHALL BE SET TO A LOGIC 0.
5	PARTITIONED/COMMON (P/C) LOGIC 1 = PARTITIONED LOGIC 0 = COMMON
6	NET TIME REFERENCE (NTR) LOGIC 1 = TERMINAL IS THE NET TIME REFERENCE
7	LOGIC 1 = PERFORM OTAR
8-10	VARIABLE NUMBER FOR TRANSEC (0-7)
11	SDU ALARM CHECK (ALMCK) LOGIC 1 = PERFORM SDU ALARM CHECK
12	COARSE SYNC CONFIRMED (CSC) LOGIC 1 = COARSE SYNC CONFIRMED

BIT	DESIGNATION
13	FINE SYNC ACHIEVED (FSA) LOGIC 1 = FINE SYNC ACHIEVED
14	PTP RESET (RESET) LOGIC 1 = RESET PTP
15	START MAILBOX TEST (SMT) LOGIC 1 = START MAILBOX TEST

10.1.1.1.1.2 Variable for Slot N Word. The Variable for Slot N Word shall be provided by the NICP every slot time and shall be used by the PTP for commanding what variable is to be used in the current slot (see Figure I-II). The variable for slot N word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0041_{16}
								RRRT				CT	DECRYPT VAR			

The bit designation shall be as follows:

BIT	DESIGNATION
0-2	VARIABLE NUMBER FOR DECRYPT 0-7
3	CATALOG TYPE (CT) LOGIC 1 = IJMD SLOT LOGIC 0 = TADIL J SLOT
4-6	NOT USED
7	REPROMULGATION RELAY OR RANGE TEST INDICATOR (RRRT) LOGIC 1 = ACTIVE (NOT TO BE SET IN AN HPA CONFIGURATION)
8-15	NOT USED

10.1.1.1.1.3 System Time Parameter Words (Words 3 through 8). Six System Time Parameter Words shall be provided by the NICP every slot time and will be used by the PTP for updating system time. During normal TDMA operation (after coarse sync) words 3 through 5 shall be the time of day for the present slot (N) and words 6 through 8 shall be the time of day for slot (N+1).

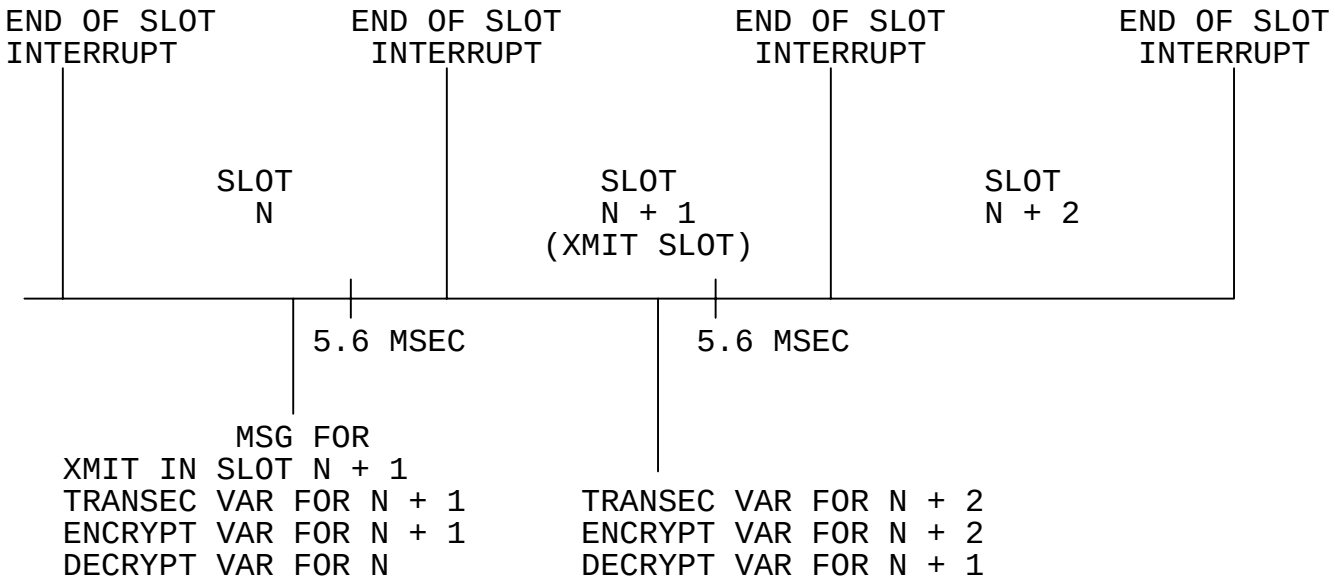
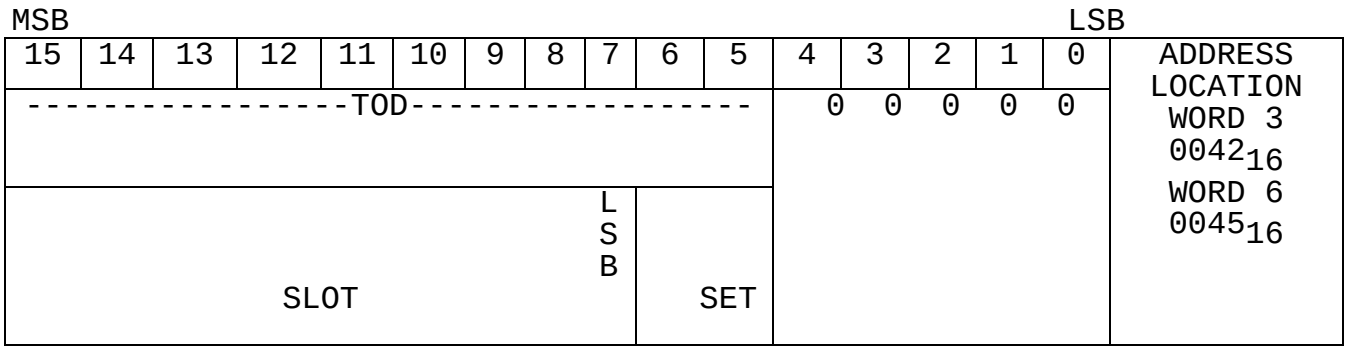


FIGURE I-II. NICP - PTP VARIABLE TRANSFER COMMAND TIMING

10.1.1.1.1.3.1 Time of Day Word 1. The word format for Time of Day Words 3 and 6 shall be as follows:



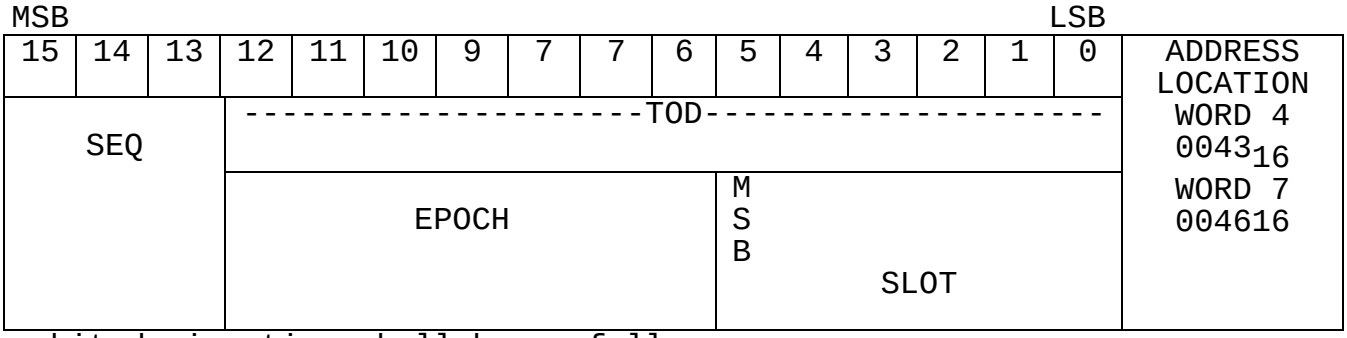
The bit designation shall be as follows:

BIT	DESIGNATION
0-4	SET TO LOGIC "00000"

NOTE: SET TO LOGIC 0 EXCEPT WHEN PERFORMING OTAR IN SLOT N+1

5-6	SET A = 0 1 SET B = 1 0 SET C = 1 1 0 0 = ILLEGAL
7-15	9 BITS OF 15 BIT TIME SLOT VALUE (6 MORE SIGNIFICANT BITS ARE LOCATED IN TOD WORD 2) RANGE: 0-32767

10.1.1.1.1.3.2 Time of Day Word 2. The word format for Time of Day Words 4 and 7 shall be as follows:



The bit designation shall be as follows:

BIT	DESIGNATION
0-5	6 BITS OF 15 BIT TIME SLOT VALUE (9 LESS SIGNIFICANT BITS ARE LOCATED IN TOD WORD 1)
6-12	EPOCH RANGE: 0-112
13-15	SEQUENCE (0-7)

10.1.1.1.1.3.3 Time of Day Word 3. The word format for Time of Day words 5 and 8 shall be as follows:

MSB															LSB	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION WORD 5 0044_{16} WORD 8 0047_{16}
									NET							

The bit designation shall be as follows:

BIT	DESIGNATION
0-6	NET NUMBER (0-127)
7-15	NOT USED

10.1.1.1.1.4 Message Type (Header of Message) Word. The Message Type Word shall be provided by the NICP when a message is scheduled for transmission in the next slot. The PTP shall use this word as part of the header of the transmitted message. If no message is scheduled for transmission, this word will not be updated by the NICP. The Message Type Word format shall be as follows:

MSB															LSB	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0048_{16}
												T/M	MSG TYPE			

The bit designation shall be as follows:

BIT	DESIGNATION
0-2	MESSAGE TYPE (0-7) (see 10.1.1.2.2)
3	RELAY INDICATOR/TYPE MODIFIER (see 10.1.1.2.2) IF MSG TYPE IS A FIXED FORMAT MESSAGE LOGIC 1 = MESSAGE IS A RELAY LOGIC 0 = MESSAGE IS NOT A RELAY IF MSG TYPE IS A FREE TEXT MESSAGE THIS BIT IS THE MESSAGE TYPE MODIFIER
4-15	NOT USED

10.1.1.1.1.5 Source Track Number (Message). The Message Source Track Number Word shall be provided by the NICP when a message is scheduled for transmission in the next slot. The PTP shall use this word as part of the header of the transmitted message. If no message is scheduled for transmission, this word will not be updated by the NICP. The Source Track Number Word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0049_{16}
	SOURCE TRACK NUMBER															

The bit designation shall be as follows:

BIT	DESIGNATION
0-14	SOURCE TRACK NUMBER (STN) CONSISTS OF FIVE OCTAL DIGITS (00000 TO 77777)

	D 4	D 3	D 2	D 1	D 0
BITS	14,13,12	11,10,9	8,7,6	5,4,3	2,1,0

10.1.1.1.1.6 Message Type (Transmit Control) Word. The Message Type Transmit Control Word shall be provided by the NICP for the next slot. When a message is scheduled for transmission in the next slot, the PTP shall use this word for determining if message data error coding is to be employed and length of transmitted message. In addition, the PTP shall perform appropriate parity computations and field reversals based upon the Catalog Type bit and the message type for transmit slots. If no message is scheduled for transmission, this word will not be updated by the NICP. The Message Type Transmit Control Word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 004A
										CT	RTT	T--M	MSG TYPE			

The bit designation shall be as follows:

BIT	DESIGNATION
0-2	MESSAGE TYPE (0-7) (MSG TYPE) (see 10.1.1.2.2)
3	RELAY INDICATOR/TYPE MODIFIER (T/M) (see 10.1.1.2.2) IF MSG TYPE IS A FIXED FORMAT MESSAGE LOGIC 1 = MESSAGE IS A RELAY LOGIC 0 = MESSAGE IS NOT A RELAY IF MSG TYPE IS A FREE TEXT MESSAGE THIS BIT IS THE MESSAGE TYPE MODIFIER
4	RTT/NORMAL MESSAGE (RTT) (see 10.1.1.2.2) LOGIC 1 = RTT MESSAGE LOGIC 0 = NORMAL MESSAGE
5	CATALOG TYPE (CT) LOGIC 1 = IJMS SLOT LOGIC 0 = TADIL J
6-15	NOT USED

10.1.1.1.1.7 Slot Type (N+1) Word. The Slot Type Word shall be provided by the NICP every slot time and shall command the terminal operating mode for the next time slot (N+1). The format for the Slot Type Word shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $004B_{16}$
MOD	FB	RTT 2B	RELAY MSG TAG					NR -- ER	CSI	I/O	N -- RS	MODE		SLOT TYPE		

The bit designation shall be as follows:

BIT	DESIGNATION

0-1 SLOT TYPE

BIT 1	0	
0	0	RECEIVE ONLY (NO RTT)
0	1	RECEIVE (RESPOND TO RTT)
1	0	TRANSMIT
1	1	NOT USED

NOTE: When Bit 7 of Variable for Slot N + 1 Word (10.1.1.1.1.1) (OTAR) is set to logic 1 the slot type shall be set to receive only (NO RTT).

2-3 COMMUNICATIONS MODE (MODE)

BIT 3	2	
0	0	NOT USED
0	1	MODE 1
1	0	MODE 2
1	1	MODE 4

4 NORMAL/RELAY SLOT (N/RS) *
LOGIC 0 = NORMAL
LOGIC 1 = RELAY SLOT

5 RELAY IN/OUT (I/O) *
LOGIC 0 = RELAY IN
LOGIC 1 = RELAY OUT

* SEE PARTITIONED RELAY CONTROL STATE DEFINITION BELOW

PARTITIONED RELAY CONTROL STATES

BIT 5 (RELAY IN)* (RELAY OUT)	BIT 4 NORM* PART RELAY	STATE
0	0	0
0	1	1
1	0	2
1	1	3

If Norm*=0, then (Relay IN)* is a don't care, i.e., states 0 and 2 are the same (not a partitioned relay slot).

State 1 If slot is also transmit slot, the terminal shall retransmit in relay out slot.

If slot is a receive slot, normal situation with received message saved in relay RAM (CTP) and buffer TAG shall be sent to Global Memory. The relay RAM buffers the incoming PVM received messages, and the buffer tag identifies the location of the held PVM received message.

State 3 If no message was received in State 1, (partitioned relay in slot) then the slot should be set to:

REC slot

NORM* = 0

However, NICP shall treat any received message in this slot as the reception of a relayed partitioned relay, which is a PVM received message with the relay bit = 1 (ie. relayed by someone else).

If message was received in State 1 (partitioned relay in slot), then the slot should be set to xmit slot, partitioned relay = 1, relay out = 1 plus buffer TAG for relay RAM.

BIT	DESIGNATION
6	COARSE SYNC INITIATION (CSI) LOGIC 1 = COARSE SYNC INITIATE LOGIC 0 = NORMAL
7	NORMAL/EXTENDED RANGE (NR/ER) LOGIC 1 = EXTENDED RANGE LOGIC 0 = NORMAL RANGE

BIT	DESIGNATION
8-12	RELAY MSG TAG (0-31) INDICATES 1 OF 32 RELAY OUTPUT BUFFERS TO BE RELEASED WHEN COMMANDED BY BITS 4 AND 5.
13	RTT - 2B RECEIVE SLOT (RTT 2B) LOGIC 1 = RTT 2B RECEIVE SLOT LOGIC 0 = NON-RTT 2B RECEIVE SLOT
14	FREE RELAY BUFFER (FB) LOGIC 1 = FREE RELAY BUFFER DESIGNATED BY RELAY MSG LOGIC 0 = NORMAL
15	MODULATOR CONTROL (MOD) LOGIC 1 = NORMAL LOGIC 0 = PERFORM CPSM LOOPBACK CHECK (BYPASS R/T)

10.1.1.1.1.8 TOA Adjustment Words. Three TOA Adjustment Words shall be provided by the NICP every slot time and shall be used by the PTP for compensating the installation received cable delays. When operating in a single antenna mode, the PTP shall utilize TOA Adjustment Antenna A Word. In this mode of operation the NICP shall store the correct cable delay constant in TOA Adjustment Antenna A Word as TOA Adjustment Antenna B Word will not be used by the PTP. When operating in the dual antenna mode, the NICP shall supply the cable delay constants for both TOA Adjustment Antenna A and Antenna B words with the PTP selecting the proper word depending upon which receiving antenna was selected. The third TOA Adjustment Word (TOA Adjustment Sum Word) shall be used only when operating in a receiver signal summing configuration mode.

10.1.1.1.1.8.1 TOA Adjustment Antenna A Word The format for the TOA Adjustment Antenna A word shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $004C_{16}$
TOA ADJUSTMENT ANTENNA A																

The bit designation shall be as follows:

BIT	DESIGNATION
0-15	TOA ADJUSTMENT LSB = 12.5 NANOSECONDS

10.1.1.1.1.8.2 TOA Adjustment Antenna B Word, (Address $004D_{16}$). The format for the TOA Adjustment Antenna B word shall be the same as the TOA Adjustment Antenna A word format.

10.1.1.1.1.8.3 TOA Adjustment Sum Word, (Address $004E_{16}$). Reserved for future growth.

10.1.1.1.1.9 Receiver Threshold (DATA) Word. The Receiver Threshold for Data Word shall be provided by the NICP every slot time and shall be used to control the receiver threshold when receiving the data portion of the TDMA message. The Receiver Threshold (DATA) Word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $004F_{16}$
		DOUBLE PULSE								SINGLE PULSE						

The bit designation shall be as follows:

BIT	DESIGNATION
0-5	RECEIVER THRESHOLD USED WHEN RECEIVING SINGLE PULSE MESSAGE DATA (0-63)
6-7	NOT USED
8-13	RECEIVER THRESHOLD USED WHEN RECEIVING DOUBLE PULSE MESSAGE DATA (0-63)
14-15	NOT USED

10.1.1.1.1.10 Receiver Threshold (Sync) Word. The Receiver Threshold for Sync Word shall be provided by the NICP every slot time and shall be used to control the receiver threshold when receiving the sync portion of the TDMA message. The Receiver Threshold (Sync) word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0050_{16}
FULL SYNC								ANT	RCV	MINI SYNC						

The bit designation shall be as follows:

BIT	DESIGNATION
0-5	RECEIVER THRESHOLD USED FOR MINI SYNC DETECTION (0-63)

BIT	DESIGNATION
6	RCVR CONFIGURATION (RCV) LOGIC 1 = 8 RECEIVER OR 4 RECEIVER DUAL ANTENNA LOGIC 0 = NOT USED
7	RECEIVER ANTENNA CONFIGURATION (ANT) LOGIC 1 = DUAL ANTENNA LOGIC 0 = SINGLE ANTENNA
8-15	RECEIVER THRESHOLD USED FOR FULL SYNC DETECTION (0-255)

10.1.1.1.1.11 Time Quality Word. The Time Quality Word shall be provided by the NICP every slot time and shall be used when generating and/or responding to a type 2B RTT interrogation message. The format of the Time Quality Word shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0051_{16}
								Q_{TA}				Q_{TS}				

The bit designation shall be as follows:

BIT	DESIGNATION
0.3	SOURCE TIME QUALITY (Q_{TS}) USED TO DETERMINE IF A RTT REPLY SHOULD BE SENT IN RESPONSE TO A RECEIVED TYPE 2B RTT INTERROGATION MESSAGE (0 TO 15)
4-7	TIME QUALITY ADDRESSEE (Q_{TA}) THAT IS TO BE TRANSMITTED IN THE TYPE 2B RTT INTERROGATION MESSAGE (0 TO 15)
8-15	NOT USED

10.1.1.1.1.12 Source Track Number Word. The Source Track Number Word shall be provided by the NICP every slot time and shall be used by the PTP for determining when a type 2A RTT interrogation message is addressed to the terminal. The format of the Source Track Number Word shall be the same as the Source Track Number (message) word specified in 10.1.1.1.1.5. The address location for the Source Track Number Word shall be 0052_{16}.

10.1.1.1.1.13 Track Number Addressee Word. The Track Number Addressee Word shall be provided by the NICP when a type 2A RTT interrogation message is scheduled for transmission in the next slot. The PTP shall use this word as part of the header of the transmitted type 2A RTT interrogation message. If no type 2A RTT interrogation message is scheduled for transmission, this word will not be updated by the NICP. The format of the Track Number Addressee word shall be the same as the Source Track Number (Message) word specified in 10.1.1.1.1.5. The address location for the Track Number Addressee word shall be 0053_{16}.

10.1.1.1.1.14 R/T Word 1. The NICP shall supply the R/T Word 1 every slot time and it shall be used by the PTP to control the R/T Transmitter/Receiver configuration. The format for R/T Word 1 shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0054_{16}
IPFR	TACAN		RD	TXB	XML	SBR	INIT	XMIT ANT		R/T EXCITER OUTPUT CONTROL			HPA/PA OVERRIDE	RCVR CONFIG		
	XPOND	INTE														

The bit designation shall be as follows:

BIT	DESIGNATION
0-1	RECEIVER CONFIGURATION

BIT 1	0	
0	0	DUAL CHANNEL
0	1	ALL RECEIVERS ON ANT A
1	0	ALL RECEIVERS ON ANT B
1	1	NOT USED

2 HPA/PA OVERRIDE
LOGIC 1 = TRANSMIT NORMAL OR RECEIVE NORMAL*
LOGIC 0 = TRANSMIT OVERRIDE OR RECEIVE J8*

3-4 EXCITER OUTPUT CONTROL

BIT 4	3	
1	0	EXCITER OUTPUT OFF;R/T PA HIGH POWER
1	1	EXCITER OUTPUT J8 - TDMA ONLY; R/T PA TRANSMIT TACAN **

5 RECEIVE/TRANSMIT (R/T)
LOGIC 1 = RECEIVE
LOGIC 0 = TRANSMIT

6-7 TRANSMIT ANTENNA CONFIGURATION

BIT 7	6	
0	0	DUAL ANTENNA A AND B
0	1	ANT A
1	0	ANT B
1	1	NOT USED

8 START R/T INITIALIZATION (INIT)
LOGIC 1 = START R/T INITIALIZATION DATA TRANSFER (DATA LOCATED IN R/T WORDS 3 THROUGH 6) THIS BIT SHALL BE SET TO LOGIC 1 WHEN IT IS REQUIRED TO COMMAND TDMA SELF TEST, R/T PUSH-TO-TEST, OR TO UPDATE THE R/T INITIALIZATION CONSTANTS.
LOGIC 0 = NORMAL

* DEFINITION DEPENDS ON BIT 5

** IF TACAN IS "OFF" OR CAPABILITY TO RECEIVE VIA J8 NOT APPLICABLE, THEN R/T PA OFF.

BIT	DESIGNATION
9	START R/T BIT REPORTING (SBR) LOGIC 1 = START R/T BIT REPORTING (COMMAND SHOULD BE SENT TO A TRANSMIT SLOT) LOGIC 0 = NORMAL
10	TRANSMIT MESSAGE LENGTH (XML) LOGIC 1 = PACKED 4 OR PACKED 2 DP MESSAGE LOGIC 0 = NORMAL (STANDARD/PACKED 2 SP)
11	TACAN TRANSMIT BACKOFF (TXB) LOGIC 1 = ALLOW TACAN TRANSMIT AFTER SYNC PREAMBLE ON TRANSMIT LOGIC 0 = NO TACAN TRANSMIT DURING NORMAL MESSAGE TRANSMIT
12	RECEIVER DISABLE (RD) LOGIC 1 = DISABLE RECEIVERS LOGIC 0 = NORMAL
13	TACAN INTERROGATION (INTE) LOGIC 1 = NORMAL LOGIC 0 = STOP INTERROGATION
14	TACAN TRANSPOND (XPOND) LOGIC 1 = NORMAL LOGIC 0 = STOP TRANSPOND
15	INTERFERENCE PROTECTION FEATURE RESET (IPFR) LOGIC 1 = NORMAL LOGIC 0 = RESET

10.1.1.1.1.15 R/T Word 2. The NICP shall supply the R/T Word 2 every slot time. The format for R/T Word 2 shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0055_{16}
				R/S CV ID			R/S CV	HPAP			RTTRTO	RTTRM	HPA OUTPUT LEVEL			

The bit designation shall be as follows:

BIT	DESIGNATION
0-2	HPA OUTPUT LEVEL

BIT 2	1	0	
0	0	0	HPA OFF
0	0	1	HIGH POWER MODE (1260 WATTS)
0	1	0	LOW POWER MODE (157 WATTS ± 1 dB FROM EACH PORT)
0	1	1	NOT USED
.	.	.	
.	.	.	
.	.	.	
1	1	1	NOT USED

3	RTT RECEIVE MODE (RTTRM) LOGIC 0 = RECEIVE NORMAL LOGIC 1 = RECEIVE J8
4	RTT REPLY THERMAL OVERRIDE (RTTRTO) LOGIC 0 = NORMAL RTT REPLY LOGIC 1 = THERMAL OVERRIDE RTT REPLY
5-6	NOT USED
7	HPA PRESENT (HPAP) LOGIC 1 = HPA PRESENT LOGIC 0 = HPA NOT PRESENT

BIT	DESIGNATION
8	R/S CIRCUMVENT (R/S CV) LOGIC 1 = CIRCUMVENT THE R/S IDENTIFIED IN BITS 9-11 LOGIC 0 = DO NOT CIRCUMVENT ANY R/S
9-11	R/S CIRCUMVENT IDENTIFIER (R/S CV ID)

BITS 11	10	9	
0	0	0	RECEIVER/SYNTHESIZER 1
0	0	1	RECEIVER/SYNTHESIZER 2
0	1	0	RECEIVER/SYNTHESIZER 3
0	1	1	RECEIVER/SYNTHESIZER 4
1	0	0	RECEIVER/SYNTHESIZER 5
1	0	1	RECEIVER/SYNTHESIZER 6
1	1	0	RECEIVER/SYNTHESIZER 7
1	1	1	RECEIVER/SYNTHESIZER 8

12-15	NOT USED

10.1.1.1.1.16 R/T Word 3. The NICP shall supply the R/T Word 3 when it is required to command TDMA self test, R/T push-to-test or to update the R/T initialization constants. This word shall be valid only when the start R/T initialization bit (bit 8 of R/T word 1 see 10.1.1.1.1.14) is set to logic 1. The format for R/T Word 3 shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION
								TDMA STI	PTTE		R/T CONF		RFA B TEST	RFA A TEST	RFA TEST V	0056_{16}

The bit designation shall be as follows:

BIT	DESIGNATION
0	LOGIC 1 = RFA TEST VALID (RFA TEST V) LOGIC 0 = RFA TEST NOT VALID
1	LOGIC 1 = RFA-A TEST LOGIC 0 = NO TEST
2	LOGIC 1 = RFA-B TEST LOGIC 0 = NO TEST
3-4	R/T RECEIVER CONFIGURATION (R/T CONF)

BIT 4	3	
0	0	FOUR (4) RECEIVER (ARMY, NOT USED BY NAVY)
0	1	FOUR (4) RECEIVER (UK, NOT USED BY NAVY)
1	0	EIGHT (8) RECEIVERS (ARMY, F-15)
1	1	NOT USED

5	NOT USED
6	PUSH TO TEST ENABLE (PTTE) LOGIC 1 = ENTER PUSH-TO-TEST IN NEXT SLOT

BIT	DESIGNATION
7	TDMA SELF TEST INITIATE LOGIC 1 = INITIATE TDMA SELF TEST LOGIC 0 = NORMAL
8-15	NOT USED

10.1.1.1.1.17 R/T WORD 4. RESERVED

10.1.1.1.1.18 R/T WORD 5.

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0058_{16}
OUT-OF-BOUNDS FREQUENCIES								SYNTHESIZER FREQUENCY MISMATCHES								

The bit designation shall be as follows:

BIT	DESIGNATION
0-7	MAXIMUM NUMBER OF COUNTS FOR SYNTHESIZER FREQUENCY MISMATCHES (0-255)
8-15	MAXIMUM NUMBER OF COUNTS FOR OUT-OF-BOUNDS FREQUENCIES (0-255)

10.1.1.1.1.19 R/T WORD 6. The NICP shall supply the R/T Word 6 when it is required to initiate or update the R/T initialization constants. This word shall be valid only when the start R/T initialization bit (bit 8 of R/T Word 1 see 10.1.1.1.1.14) is set to LOGIC 1. The format for R/T Word 6 shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0059_{16}
PULSE WIDTH								1030 / 1090								

The bit designation shall be as follows:

BIT	DESIGNATION
0-7	MAXIMUM NUMBER OF COUNTS FOR 1030 AND/OR 1090 MHz (0-255)
8-15	MAXIMUM NUMBER OF PULSES EXCEEDING LIMIT FOR PULSE WIDTH (0-255)

10.1.1.1.1.20 Transmit Time Word 1. The format shall be as follows:

MSB															LSB	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $005A_{16}$
					TRANSMIT TIME (R)											

The bit designation shall be as follows:

BIT	DESIGNATION
0-10	11 BITS OF 19 BIT TRANSMIT TIME EXPRESSION IN STRAIGHT BINARY COUNT (REMAINDER PART OF TRANSMIT TIME EXPRESSION) LSB: 12.5 Nanoseconds/count
11-15	NOT USED

10.1.1.1.1.21 Transmit Time Word 2. The format shall be as follows:

MSB															LSB	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $005B_{16}$
								TRANSMIT TIME (I)								

The bit designation shall be as follows:

BIT	DESIGNATION
0-7	8 BITS OF 19 BIT TRANSMIT TIME EXPRESSION IN STRAIGHT BINARY COUNT (INTEGER PART OF TRANSMIT TIME EXPRESSION) LSB = 25.6 Microseconds/count
8-15	NOT USED

10.1.1.1.1.22 Receive Buffer Address Word. The NICP shall supply a valid TDMA Receive Message Buffer starting address every slot time for use by the PTP for storing the incoming received TDMA message into Global Memory. The Receive Buffer starting address word obtained in slot N+1 shall be used by the PTP to store the TDMA message received in Slot N. The Receive Buffer Address Word format shall be as follows:

MSB															LSB	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $005C_{16}$
			ADDRESS													

The bit designation shall be as follows:

BIT	DESIGNATION
0-12	RECEIVE BUFFER STARTING ADDRESS
13-15	NOT USED

10.1.1.1.1.23 Transmit Buffer Address Word. The Transmit Buffer Starting Address Word shall be provided by the NICP and shall inform the PTP in what buffer the TDMA message for transmission has been stored. The transmit buffer starting address word obtained in slot N shall be used by the PTP for message transmission processing in slot N and transmission in slot N+1. The Transmit Buffer Address Word format shall be as follows:

MSB															LSB	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $005D_{16}$
			ADDRESS													

The bit designation shall be as follows:

BIT	DESIGNATION
0-12	TRANSMIT BUFFER STARTING ADDRESS
13-15	NOT USED

10.1.1.1.1.24 Time Correction Word. The format for the Time Correction Word shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $005E_{16}$
SIGN	TIME CORRECTION ----------(MAGNITUDE)----------															

The bit designation shall be as follows:

BIT	DESIGNATION
0-14	TIME CORRECTION (MAGNITUDE) LSB: 12.5 Nanoseconds
15	SIGN BIT LOGIC 1 = LENGTHEN SLOT (RETARDS TIME) LOGIC 0 = SHORTEN SLOT (ADVANCES TIME)

10.1.1.1.1.25 Variables for Zeroing Word. The Variables for Zeroing Word shall be provided by the NICP when it is required to erase the variables in the SDU. The erase process will be commanded by bit 3 of the Variable for Slot N+1 Word (10.1.1.1.1.1) being set to LOGIC 1. The minimum number of variables to be erased is one and the maximum is eight. The variables for Zeroing Word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $005F_{16}$
								VAR 7	VAR 6	VAR 5	VAR 4	VAR 3	VAR 2	VAR 1	VAR 0	

The bit designation shall be as follows:

BIT	DESIGNATION
0	LOGIC 1 = ZERO VARIABLE IN LOCATION 0
1	LOGIC 1 = ZERO VARIABLE IN LOCATION 1
2	LOGIC 1 = ZERO VARIABLE IN LOCATION 2
3	LOGIC 1 = ZERO VARIABLE IN LOCATION 3
4	LOGIC 1 = ZERO VARIABLE IN LOCATION 4
5	LOGIC 1 = ZERO VARIABLE IN LOCATION 5
6	LOGIC 1 = ZERO VARIABLE IN LOCATION 6
7	LOGIC 1 = ZERO VARIABLE IN LOCATION 7
8-15	NOT USED

10.1.1.1.2 TDMA Message Transmission. The PTP upon receipt of each initiate Message Transmission (slot type field of slot type (N+1) word, see 10.1.1.1.1.7, being set to transmit) shall transfer the contents of the TDMA message transmit buffer (starting address located in transmit buffer address word (see 10.1.1.1.1.23)) and initiate the transmission of the TDMA message. TADIL J messages that shall be handled include the following:

TYPE	T/M	MESSAGE
0	0	STANDARD FT UNCODED
0	1	PACKED 2-SP FT UNCODED
4	RI	STANDARD FF CODED
2	0	TYPE 2A RTT INTERROGATION
2	1	TYPE 2B RTT INTERROGATION
6	0	STANDARD FT CODED
6	1	PACKED 2-SP FT CODED
1	1	PACKED 4-SP FT UNCODED
2	1	PACKED 4-SP FT CODED
1	0	PACKED 2-DP FT UNCODED
2	0	PACKED 2-DP FT CODED
3	RI	PACKED 2-SP FF CODED
7	RI	PACKED 4-SP FF CODED
5	RI	PACKED 2-DP FF CODED

Figures I-III through I-XIV depict the buffer composition for the various message types and T/Ms.

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1	15														0	
wd 2	31														16	
wd 3	47														32	
wd 4	63														48	
wd 5	79														64	
wd 6	95														80	
wd 7	111														96	
wd 8	127														112	
wd 9	143														128	
wd 10	159														144	
wd 11	175														160	
wd 12	191														176	
wd 13	207														192	
wd 14	223														208	
wd 15	239														224	
wd 16	255														240	
wd 17	271														256	
wd 18	287														272	
wd 19	303														288	
wd 20	319														304	
wd 21	335														320	
wd 22	351														336	
wd 23	367														352	
wd 24	383														368	
wd 25	399														384	
wd 26	415														400	
wd 27	431														416	
wd 28	447														432	
wd 29	463														448	
wd 30																464

FIGURE I-III. TYPE 0/0 STANDARD-FT (NON-ERROR CODED) MESSAGE FOR XMIT˝

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1	15														0	
wd 2	31														16	
wd 3	47														32	
:																
wd 28	447														432	
wd 29	463														448	
wd 30																464
wd 31	15														0	
wd 32	31														16	
wd 33	47														32	
:																
wd 58	447														432	
wd 59	463														448	
wd 60																464

FIGURE I-IV. TYPE 0/1 PACKED 2-SP-FT (NON-ERROR-CODED) MESSAGE FOR XMIT

˝	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1		15													0	
wd 2		31													16	
wd 3		47													32	
wd 4		63													48	
wd 5											69					64
wd 6		95													80	
wd 7		111													96	
wd 8		127													112	
wd 9		143													128	
wd 10											69					64
wd 11		175													160	
wd 12		191													176	
wd 13		207													192	
wd 14		223													208	
wd 15											69					64

FIGURE I-V. TADIL J TYPE 4 STANDARD-FF (ERROR-CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1		15													0	
wd 2		31													16	
wd 3		47													32	
wd 4		63													48	
wd 5		79													64	
wd 6		95													80	
wd 7		111													96	
wd 8		127													112	
wd 9		143													128	
wd 10		159													144	
wd 11		175													160	
wd 12		191													176	
wd 13		207													192	
wd 14		223													208	
wd 15																224

FIGURE I-VI. TYPE 6/0 STANDARD-FT (ERROR-CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1		15													0	

wd 2	31	16
wd 3	47	32
wd 4	63	48
wd 5	79	64
wd 6	95	80
wd 7	111	96
wd 8	127	112
wd 9	143	128
wd 10	159	144
wd 11	175	160
wd 12	191	176
wd 13	207	192
wd 14	223	208
wd 15		224
wd 16	15	0
wd 17	31	16
wd 18	47	32
wd 19	63	48
wd 20	79	64
wd 21	95	80
wd 22	111	96
wd 23	127	112
wd 24	143	128
wd 25	159	144
wd 26	175	160
wd 27	191	176
wd 28	207	192
wd 29	223	208
wd 30		224

FIGURE I-VII. TYPE 6/1 PACKED 2-SP-FT (ERROR-CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1	15														0	
wd 2	31														16	
:	:															
wd 29	463														448	
wd 30																464
wd 31	15														0	
wd 32	31														16	
:	:															
wd 59	463														448	
wd 60																464
wd 61	15														0	
wd 62	31														16	
:	:															
wd 89	463														448	
wd 90																464
wd 91	15														0	
wd 92	31														16	
:	:															
wd 119	463														448	
wd 120																464

FIGURE I-VIII. TYPE 1/1 PACKED 4-SP-FT (NON ERROR CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1	15														0	
wd 2	31														16	
:									:							
wd 13	207														192	
wd 14	223														208	
wd 15																224
wd 16	15														0	
wd 17	31														16	
:									:							
wd 28	207														192	
wd 29	223														208	
wd 30																224
wd 31	15														0	
wd 32	31														16	
:									:							
wd 43	207														192	
wd 44	223														208	
wd 45																224
wd 46	15														0	
wd 47	31														16	
:									:							
wd 58	207														192	
wd 59	223														208	
wd 60																224

FIGURE I-IX. TYPE 2/1 PACKED 4-SP-FT (ERROR-CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1		15													0	
wd 2		31													16	
wd 3		47													32	
:									:							
wd 28		447													432	
wd 29		463													448	
wd 30																464
wd 31		15													0	
wd 32		31													16	
wd 33		47													32	
:									:							
wd 58		447													432	
wd 59		463													448	
wd 60																464

FIGURE I-X. TYPE 1/0 PACKED 2-DP-FT (NON ERROR CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1	15														0	
wd 2	31														16	
wd 3	47														32	
wd 4	63														48	
wd 5	79														64	
wd 6	95														80	
wd 7	111														96	
wd 8	127														112	
wd 9	143														128	
wd 10	159														144	
wd 11	175														160	
wd 12	191														176	
wd 13	207														192	
wd 14	223														208	
wd 15																224
wd 16	15														0	
wd 17	31														16	
wd 18	47														32	
wd 19	63														48	
wd 20	79														64	
wd 21	95														80	
wd 22	111														96	
wd 23	127														112	
wd 24	143														128	
wd 25	159														144	
wd 26	175														160	
wd 27	191														176	
wd 28	207														192	
wd 29	223														208	
wd 30																224

FIGURE I-XI. TYPE 2/0 PACKED 2-DP-FT (ERROR CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1		15													0	
wd 2		31													16	
wd 3		47													32	
wd 4		63													48	
wd 5											69					64
wd 6		15													0	
wd 7		31													16	
wd 8		47													32	
wd 9		63													48	
wd 10											69					64
wd 11		15													0	
wd 12		31													16	
wd 13		47													32	
wd 14		63													48	
wd 15											69					64
wd 16		15													0	
wd 17		31													16	
wd 18		47													32	
wd 19		63													48	
wd 20											69					64
wd 21		15													0	
wd 22		31													16	
wd 23		47													32	
wd 24		63													48	
wd 25											69					64
wd 26		15													0	
wd 27		31													16	
wd 28		47													32	
wd 29		63													48	
wd 30											69					64

FIGURE I-XII. TYPE 3 PACKED 2-SP-FF (ERROR-CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1	15															0
:	:															
wd 5											69					64
wd 6	15															0
:	:															
wd 10											69					64
wd 11	15															0
:	:															
wd 15											69					64
wd 16	15															0
:	:															
wd 20											69					64
wd 21	15															0
:	:															
wd 25											69					64
wd 26	15															0
:	:															
wd 30											69					64
wd 31	15															0
:	:															
wd 35											69					64
wd 36	15															0
:	:															
wd 40											69					64
wd 41	15															0
:	:															
wd 45											69					64
wd 46	15															0
:	:															
wd 50											69					64
wd 51	15															0
:	:															
wd 55											69					64
wd 56	15															0
:	:															
wd 60											69					64

FIGURE I-XIII. TYPE 7 PACKED 4-SP-FF (ERROR-CODED) MESSAGE FOR XMIT

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1	15														0	
wd 2	31														16	
wd 3	47														32	
wd 4	63														48	
wd 5											69					64
wd 6	15														0	
wd 7	31														16	
wd 8	47														32	
wd 9	63														48	
wd 10											69					64
wd 11	15														0	
wd 12	31														16	
wd 13	47														32	
wd 14	63														48	
wd 15											69					64
wd 16	15														0	
wd 17	31														16	
wd 18	47														32	
wd 19	63														48	
wd 20											69					64
wd 21	15														0	
wd 22	31														16	
wd 23	47														32	
wd 24	63														48	
wd 25											69					64
wd 26	15														0	
wd 27	31														16	
wd 28	47														32	
wd 29	63														48	
wd 30											69					64

FIGURE I-XIV. TYPE 5 PACKED 2-DP-FF (ERROR-CODED) MESSAGE FOR XMIT

10.1.1.2 PTP/NICP Data Transfer. The PTP shall write the following group of words into Global Memory every slot time (N) prior to 5.6 milliseconds after the End of Slot Interrupt is issued. The NICP shall read these words in the next time slot (N+1) after receipt of the end of slot interrupt.

WORD	FUNCTION
1	STATUS WORD
2	ETR TIME WORD 1
3	ETR TIME WORD 2
4	RELAY TAG WORD
5	SDU SERIAL NUMBER
6	UNIQUE VARIABLE UPDATE NUMBER
7	R/T BIT WORD 1
8	R/T BIT WORD 2
9	R/T BIT WORD 3
10	R/T BIT WORD 4
11	PTP BIT WORD 1
12	PTP BIT WORD 2
13	CTP BIT WORD 1
14	CTP BIT WORD 2
15	R/S ERROR WORD 1
16	R/S ERROR WORD 2
17	SPARE
18	SPARE

The listed words shall be stored in contiguous locations in Global Memory. The starting location shall be 0063_{16}. The format of these words shall be as specified in 10.1.1.2.1.

10.1.1.2.1 PTP Input Words to NICP.

PTP-TO-NICP DTB

10.1.1.2.1.1 Input Status Word. The Input Status Word shall be provided by the PTP every slot time and shall be used to inform the NICP of the following conditions:

a. TDMA message has been received
b. Coarse sync has occurred
c. ETR update is available
d. Status of SDU variables
e. SDU alarm has occurred
f. Which antenna the message was received at

The Input Status Word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0063_{16}
	R/T FAIL	TMWF	RTTIR	RTTIX	RTT	ANT	DLBI		ALARM	DVS	TVS	EVS	ETR	CS	MR	

The bit designation shall be as follows:

BIT	DESIGNATION
0	MESSAGE RECEIVED (MR) LOGIC 1 = MESSAGE HAS BEEN RECEIVED IN SLOT N-1 LOGIC 0 = NO MESSAGE HAS BEEN RECEIVED
1	COARSE SYNC (CS) LOGIC 1 = COARSE SYNC VALIDATED
2	ETR UPDATE (ETR) LOGIC 1 = ETR UPDATE AVAILABLE
3	ENCRYPT VARIABLE STATUS (EVS) LOGIC 1 = ENCRYPT VARIABLE BAD LOGIC 0 = ENCRYPT VARIABLE GOOD
4	TRANSEC VARIABLE STATUS (TVS) LOGIC 1 = TRANSEC VARIABLE BAD LOGIC 0 = TRANSEC VARIABLE GOOD
5	DECRYPT VARIABLE STATUS (DVS) LOGIC 1 = DECRYPT VARIABLE BAD LOGIC 0 = DECRYPT VARIABLE GOOD

PTP-TO-NICP DTB

BIT	DESIGNATION
6	SDU ALARM LOGIC 1 = SDU ALARM HAS OCCURRED IN SLOT N
7	NOT USED
8	DIGITAL LOOPBACK INDICATOR (DLBI) LOGIC 1 = NORMAL MODE LOGIC 0 = DIGITAL LOOPBACK MODE
9	RECEIVER ANTENNA SELECT (ANT) (VALID ONLY WHEN BIT 0 = LOGIC 1) LOGIC 1 = MESSAGE RECEIVED ON ANT B LOGIC 0 = MESSAGE RECEIVED ON ANT A
10	RTT FAIL (RTT) LOGIC 1 = RTT FAIL LOGIC 0 = NO RTT FAIL IF BIT 10, 11 = LOGIC 1: RTT NOT RECEIVED OR SDU S/N DID NOT MATCH IF BIT 10, 12 = LOGIC 1: RTT REPLY NOT GENERATED
11	RTT INTERROGATION TRANSMIT FAILURE MODIFIER (RTTIX)
12	RTT INTERROGATION RECEIVE FAILURE MODIFIER (RTTIR) NOTE: For non-RTT messages and for successful RTT messages BITS 10, 11, and 12 shall be set to LOGIC 0.
13	TUNE MODE WRAPAROUND FAIL (TMWF) LOGIC 1 = TUNE MODE WRAPAROUND FAIL
14	R/T FAIL LOGIC 1 = R/T FAIL
15	NOT USED

10.1.1.2.1.2 External Time Reference (ETR) Time Words. The ETR Time Words 1 and 2 shall be provided by the PTP when an ETR time mark has been received by the DDP. These two words shall be valid when bit 2 of the PTP input status word is set to LOGIC 1 (see 10.1.1.2.1.1). The format of the ETR Time Words shall be as follows:

MSB															LSB	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION
MSB SLOT TIME																0064_{16}
									SET	X/Y	SLOT TIME				LSB	0065_{16}

The bit designation shall be as follows:

WORD 1 0064_{16}

BIT	DESIGNATION
0-15	16 MSB BITS OF 20 BIT SLOT TIME READING AT TIME OF ETR TIME MARK. REMAINING 4 BITS ARE LOCATED IN ETR TIME WORD 2.

WORD 2 0065_{16}

BIT	DESIGNATION
0-3	4 LSB BITS OF 20 BIT SLOT TIME, REMAINING 16 BITS ARE LOCATED IN ETR TIME WORD 1. LSB = 12.5 Nanoseconds
4	SLOT X/Y LOGIC 0 = (X) SLOT TIME IS ACTUAL SLOT TIME LOGIC 1 = (Y) SLOT TIME MUST BE CORRECTED BY SUBTRACTING 100 Nanoseconds
5-6	SET AS READ FROM SDU TOD AT ETR TIME

BIT 6	5	
0	1	SET A
1	0	SET B
1	1	SET C

BIT	DESIGNATION
7-15	NOT USED

10.1.1.2.1.3 Relay Tag Word. In the slot following a received slot the PTP shall write the Relay Tag Word into GM. This word shall be read by the NICP in the slot N+2 (where N is the received slot). The Relay Tag Word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0066_{16}
								CON-TROL			RELAY TAG					

The bit designation shall be as follows:

BIT	DESIGNATION
0-4	RELAY TAG NUMBER (0-31) INDICATES ONE OF 32 RELAY INPUT BUFFERS
5	NOT USED
6-7	RELAY TAG CONTROL

BIT 7	6	
0	0	RELAY TAG IS VALID
0	1	RELAY TAG IS NOT VALID, DEFAULT
1	0	DECODE FAILURE OCCURRED
1	1	BUFFER IS FULL

8-15 NOT USED

10.1.1.2.1.4 SDU Serial Number Word. The SDU Serial Number Word shall be provided by the PTP every slot time. The SDU Serial Number Word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0067_{16}
SDU SERIAL NUMBER																

The bit designation shall be as follows:

BIT	DESIGNATION
0-15	SDU SERIAL NUMBER

10.1.1.2.1.5 Unique Variable Update Number Word. The Unique Variable Update Number (UVUN) word shall be provided by the PTP every slot time. The UVUN word format shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0068_{16}
									UVUN							

The bit designation shall be as follows:

BIT	DESIGNATION
0-6	UVUN PROVIDED BY THE KGV-8 FOR TRANSMISSION IN A J31.0 RESPONSE MESSAGE

10.1.1.2.1.6 R/T BIT Words. Four R/T BIT Words shall be provided by the PTP when received from the R/T. The R/T BIT Words can refer to both the R/T and HPA. The format of the four R/T BIT Words shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION
HISS	HISL	AIU FAULT	IF/RFCPSM	PA/HPA HIGH OVERTEMP	VSWRBF	VSWRAF	PA/HPA LOW OVERTEMP	PO ANTA		PO ANTB		FCF	OOBF	MONF	PWF	0069_{16}
HPA TMPMF								HPA MPMF				HPA SMPMF				$006A_{16}$
RECEIVER SENSITIVITY STATUS								SYNTHESIZER PLL MONITOR STATUS								$006B_{16}$
R/T TMPMF								R/T MPMF				R/T SMPMF				$006C_{16}$

The bit designation shall be as follows:

WORD 1 0069_{16} THIS WORD REFERS TO THE R/T WHEN INIT BLOCK 1, WORD 3, BIT 7 IS SET TO "HPA NOT PRESENT". THIS WORD REFERS TO THE HPA WHEN IT IS SET TO "HPA PRESENT".

BIT	DESIGNATION
0	PULSE WIDTH FAIL (PWF) LOGIC 1 = FAIL LOGIC 0 = PASS
1	1030/1090 MONITOR FAIL (MONF) LOGIC 1 = FAIL LOGIC 0 = PASS
2	OUT-OF-BOUNDS FREQUENCY FAIL (OOBF) LOGIC 1 = FAIL LOGIC 0 = PASS
3	FREQUENCY COUNTER FAIL (FCF) LOGIC 1 = FAIL LOGIC 0 = PASS

PTP-TO-NICP DTB

BIT DESIGNATION

4-5 POWER OUTPUT ANTENNA B (POANTB) STATUS

BIT 5	4	
0	0	WITHIN SPECIFICATION LIMITS ±1 dB
0	1	SOFT FAIL, < 3 dB DOWN
1	0	HARD FAIL, > 3 dB DOWN
1	1	OVER POWER, > +1 dB

6-7 POWER OUTPUT ANTENNA A (POANTA) STATUS

BIT 7	6	
0	0	WITHIN SPECIFICATION LIMITS ±1 dB
0	1	SOFT FAIL, < 3 dB DOWN
1	0	HARD FAIL, > 3 dB DOWN
1	1	OVER POWER, > +1 dB

8 PA/HPA LOW OVER TEMPERATURE STATUS
LOGIC 1 = LOW OVERTEMP CONDITION
LOGIC 0 = NORMAL TEMPERATURE CONDITION

9 VOLTAGE STANDING WAVE RATIO ANTENNA A FAIL (VSWRAF) LOGIC 1 = FAIL
LOGIC 0 = PASS

10 VOLTAGE STANDING WAVE RATIO ANTENNA B FAIL (VSWRBF)
LOGIC 1 = FAIL
LOGIC 0 = PASS

11 PA/HPA HIGH OVER TEMPERATURE STATUS
LOGIC 1 = HIGH OVER TEMPERATURE CONDITION
LOGIC 0 = NOT HIGH OVERTEMP

12 IF/RF CPSM FAIL
LOGIC 1 = FAIL
LOGIC 0 = PASS

13 AIU FAULT
LOGIC 1 = FAIL
LOGIC 0 = PASS

14 LONG TERM HISTOGRAM FAIL (HISL)
LOGIC 1 = FAIL
LOGIC 0 = PASS

15 SHORT TERM HISTOGRAM FAIL (HISS)
LOGIC 1 = FAIL
LOGIC 0 = PASS

WORD 2 $006A_{16}$ (DEDICATED TO HPA)

BIT	DESIGNATION
0-3	HPA SECOND MOST PROBABLE SRU FAILURE

BIT 3	2	1	0	MODULE	FUNCTION
0	0	0	0	NO FAIL	
0	0	0	1	A1	TOP PA SRU
0	0	1	0	A2	BOTTOM PA SRU
0	0	1	1	A3	POWER SUPPLY/ PREDRIVE SRU
0	1	0	0	A4	PROCESSOR SRU
0	1	0	1	A5	I/O SRU
0	1	1	0	A6	WAVEFORM GENERATOR SRU
0	1	1	1	A7	CHASSIS
1	0	0	0	EXTERNAL	
ALL OTHERS				NA	

BIT	DESIGNATION
4-7	HPA MOST PROBABLE SRU FAILURE

BIT 3	2	1	0	MODULE	FUNCTION
0	0	0	0	NO FAIL	
0	0	0	1	A1	TOP PA SRU
0	0	1	0	A2	BOTTOM PA SRU
0	0	1	1	A3	POWER SUPPLY/ PREDRIVE SRU
0	1	0	0	A4	PROCESSOR SRU
0	1	0	1	A5	I/O SRU
0	1	1	0	A6	WAVEFORM GENERATOR SRU
0	1	1	1	A7	CHASSIS
1	0	0	0	EXTERNAL	
ALL OTHERS				NA	

BIT	DESIGNATION
8-11	NOT USED

BIT	DESIGNATION
12-15	HPA THIRD MOST PROBABLE SRU FAILURE

BIT 3	2	1	0	MODULE	FUNCTION
0	0	0	0	NO FAIL	
0	0	0	1	A1	TOP PA SRU
0	0	1	0	A2	BOTTOM PA SRU
0	0	1	1	A3	POWER SUPPLY/ PREDRIVE SRU
0	1	0	0	A4	PROCESSOR SRU
0	1	0	1	A5	I/O SRU
0	1	1	0	A6	WAVEFORM GENERATOR SRU
0	1	1	1	A7	CHASSIS
1	0	0	0	EXTERNAL	
ALL OTHERS				NA	

PTP-TO-NICP DTB

WORD 3 $006B_{16}$ (DEDICATED TO R/T)

BIT	DESIGNATION
	SYNTHESIZER PLL MONITOR STATUS (BITS 0-7)
0	LOGIC 1 = SYNTHESIZER CH 1 PLL FAILED
1	LOGIC 1 = SYNTHESIZER CH 2 PLL FAILED
2	LOGIC 1 = SYNTHESIZER CH 3 PLL FAILED
3	LOGIC 1 = SYNTHESIZER CH 4 PLL FAILED
4	LOGIC 1 = SYNTHESIZER CH 5 PLL FAILED
5	LOGIC 1 = SYNTHESIZER CH 6 PLL FAILED
6	LOGIC 1 = SYNTHESIZER CH 7 PLL FAILED
7	LOGIC 1 = SYNTHESIZER CH 8 PLL FAILED
	RECEIVER SENSITIVITY STATUS (BITS 8-15)
8	LOGIC 1 = RECEIVER CH 1 PLL FAILED
9	LOGIC 1 = RECEIVER CH 2 PLL FAILED
10	LOGIC 1 = RECEIVER CH 3 PLL FAILED
11	LOGIC 1 = RECEIVER CH 4 PLL FAILED
12	LOGIC 1 = RECEIVER CH 5 PLL FAILED
13	LOGIC 1 = RECEIVER CH 6 PLL FAILED
14	LOGIC 1 = RECEIVER CH 7 PLL FAILED
15	LOGIC 1 = RECEIVER CH 8 PLL FAILED

WORD 4 $006C_{16}$ (DEDICATED TO R/T)

BIT	DESIGNATION

0-3 SECOND MOST PROBABLE MODULE FAILURE (SMPMF)

BIT 3	2	1	0	
0	0	0	0	NO FAILURE
0	0	0	1	POWER AMP (A1)
0	0	1	0	POWER SUPPLY (A2)
0	0	1	1	DDPI (A3)
0	1	0	0	TACAN (A4)
0	1	0	1	R/S CH 1 (A5)
0	1	1	0	R/S CH 2 (A6)
0	1	1	1	R/S CH 3 (A7)
1	0	0	0	R/S CH 4 (A8)
1	0	0	1	R/S CH 6 (A9)
1	0	1	0	R/S CH 5 (A10)
1	0	1	1	R/S CH 8 (A11)
1	1	0	0	R/S CH 7 (A12)
1	1	0	1	ANT INT UNIT (A13)
1	1	1	0	LOWER LOOP (A14)
1	1	1	1	CHASSIS (A15)

4-7 MOST PROBABLE MODULE FAILURE (MPMF)

BIT 3	2	1	0	
0	0	0	0	NO FAILURE
0	0	0	1	POWER AMP (A1)
0	0	1	0	POWER SUPPLY (A2)
0	0	1	1	DDPI (A3)
0	1	0	0	TACAN (A4)
0	1	0	1	R/S CH 1 (A5)
0	1	1	0	R/S CH 2 (A6)
0	1	1	1	R/S CH 3 (A7)
1	0	0	0	R/S CH 4 (A8)
1	0	0	1	R/S CH 6 (A9)
1	0	1	0	R/S CH 5 (A10)
1	0	1	1	R/S CH 8 (A11)
1	1	0	0	R/S CH 7 (A12)
1	1	0	1	ANT INT UNIT (A13)
1	1	1	0	LOWER LOOP (A14)
1	1	1	1	CHASSIS (A15)

8-11 NOT USED

BIT DESIGNATION

12-15 THIRD MOST PROBABLE MODULE FAILURE (TMPMF)

BIT 3	2	1	0	
0	0	0	0	NO FAILURE
0	0	0	1	POWER AMP (A1)
0	0	1	0	POWER SUPPLY (A2)
0	0	1	1	DDPI (A3)
0	1	0	0	TACAN (A4)
0	1	0	1	R/S CH 1 (A5)
0	1	1	0	R/S CH 2 (A6)
0	1	1	1	R/S CH 3 (A7)
1	0	0	0	R/S CH 4 (A8)
1	0	0	1	R/S CH 6 (A9)
1	0	1	0	R/S CH 5 (A10)
1	0	1	1	R/S CH 8 (A11)
1	1	0	0	R/S CH 7 (A12)
1	1	0	1	ANT INT UNIT (A13)
1	1	1	0	LOWER LOOP (A14)
1	1	1	1	CHASSIS (A15)

10.1.1.2.1.7 PTP BIT Words. Two PTP BIT Words shall be provided by the PTP every slot time. The format of the two PTP BIT Words shall be as follows:

MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0 LSB	ADDRESS LOCATION
													SD	PTPTEST	MBTEST	$006D_{16}$
																$006E_{16}$

The bit designation shall be as follows:

WORD 1 $006D_{16}$

BIT	DESIGNATION
0	MAILBOX TEST (MB TEST) LOGIC 1 = MAILBOX TEST GOOD
1	PTP SELF TEST (PTP TEST) LOGIC 1 = PTP SELF TEST GOOD
2	SYNC DECLARE (SD) LOGIC 1 = SYNC DECLARE
3-15	RESERVED FOR INTERNAL PTP PROCESSING

WORD 2 $006E_{16}$

BIT	DESIGNATION
0-15	RESERVED FOR INTERNAL PTP PROCESSING

10.1.1.2.1.8 CTP BIT Words. Two CTP BIT Words shall be provided by the PTP every slot time. The format of the two CTP BIT Words shall be as follows:

MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0	ADDRESS LOCATION
															RTT WA	$006F_{16}$
															RES	0070_{16}

The bit designation shall be as follows:

WORD 1 $006F_{16}$

BIT	DESIGNATION
0	RTT WRAPAROUND (RTT WA) LOGIC 1 = RTT WRAPAROUND FAIL
1-15	RESERVED FOR INTERNAL PTP PROCESSING

WORD 2 0070_{16}

BIT	DESIGNATION
0	RESERVED FOR PTP USE
1-15	SPARE

10.1.1.2.1.9 R/S Error Words. Two R/S Error Words shall be provided by the PTP every slot time. The format of the two R/S Error Words shall be as follows:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION
R/S ERASURES								R/S ERASURES								0071_{16}
R/S ERASURES								R/S ERASURES								0072_{16}

The bit designation shall be as follows:

	BIT	DESIGNATION
WORD 1	0-7	NO. OF ERASURES ON R/S 1 OR R/S 5
	8-15	NO. OF ERASURES ON R/S 6 OR R/S 2
WORD 2	0-7	NO. OF ERASURES ON R/S 3 OR R/S 7
	8-15	NO. OF ERASURES ON R/S 8 OR R/S 4

NOTE: WHICH R/S OF TWO THAT EACH ERASURE COUNT PERTAINS TO WILL BE DETERMINED BY THE NICP FROM INITIALIZATION DATA AND THE PTB INPUT STATUS WORD.

IF BITS 8-9 OF WORD 3, INITIALIZATION DATA BLOCK 1 DESIGNATE SINGLE ANTENNA A OR B, THEN THE REPORT IN LOCATIONS 0071 AND 0072 WILL BE AS FOLLOWS:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION
R/S #6 ERASURES								R/S #1 ERASURES								0071_{16}
R/S #8 ERASURES								R/S #3 ERASURES								0072_{16}

IF BITS 8-9 OF WORD 3, INITIALIZATION BLOCK 1 DESIGNATE DUAL ANTENNA THEN THE CONTENTS OF LOCATIONS 0071 AND 0072 ARE DETERMINED BY THE SETTING OF BIT 9, LOCATION 0063 AS FOLLOWS:

LOCATION 0063 INDICATES ANTENNA A

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION
R/S #6 ERASURES								R/S #1 ERASURES								0071_{16}
R/S #8 ERASURES								R/S #3 ERASURES								0072_{16}

LOCATION 0063 INDICATES ANTENNA B

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION
R/S #2 ERASURES								R/S #5 ERASURES								0071_{16}
R/S #4 ERASURES								R/S #7 ERASURES								0072_{16}

10.1.1.2.1.10 OTAR and VOLTR Indicator Word. This word is written by the PTP after an OTAR operation has been completed, or after a VOLTR interrupt has been issued by the SDU. The format for the OTAR and VOLTR Indicator Word as written by the PTP shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0157_{16}
			WV	OTS	VOLO											

The bit designation shall be as follows:

BIT	DESIGNATION
0-9	NOT USED
10	VOLTR OCCURRED (VOLO) LOGIC 1 = VOLTR INTERRUPT FROM SDU
11	OTAR SUCCESSFUL (OTS) LOGIC 1 = SUCCESSFUL COMPLETION OF OTAR
12	WORD VALID (WV) LOGIC 1 = ACKNOWLEDGEMENT BY THE PTP THAT THE NICP COMMAND TO PERFORM OTAR WAS RECEIVED
13-15	NOT USED

10.1.1.2.1.11 PTP Version Number Word. The PTP version number is written to Global Memory during power-on after the NICP has released the Global Memory Arbiter. The format for the PTP Version Number Word as written by the PTP shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0158_{16}
MAJOR NUMBER								MINOR NUMBER								

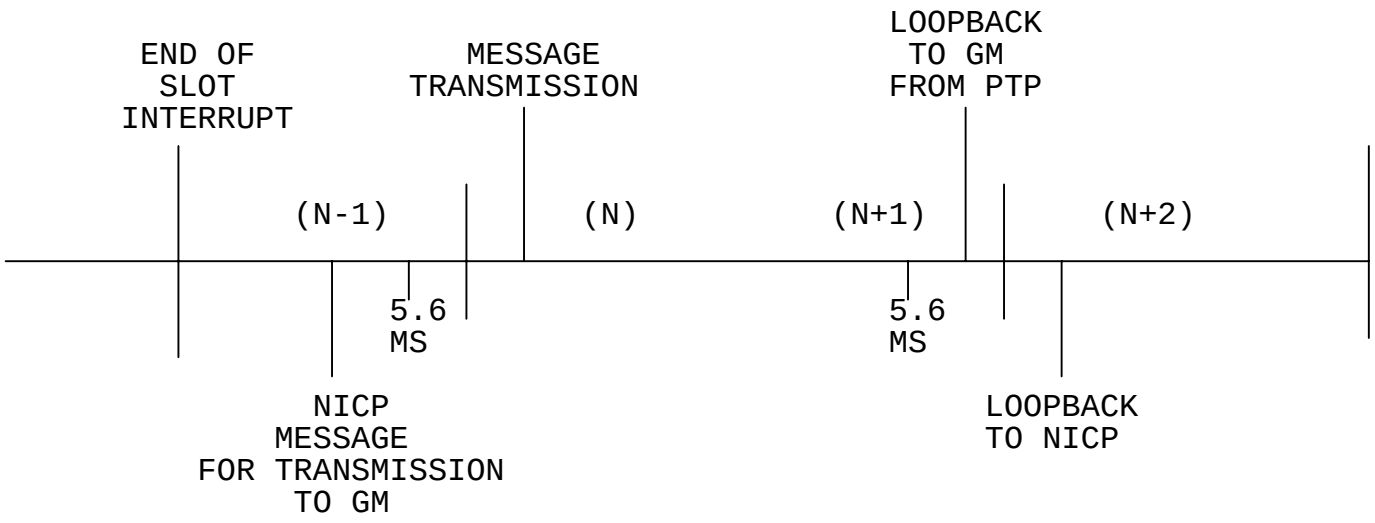


FIGURE I-XV. XMIT/LOOPBACK RELATIVE TIMING

10.1.1.2.1.12 CTP Version Number Word. The CTP version number is written to Global Memory during power-on after the NICP has released the Global Memory Arbiter. The format for the CTP Version Number Word as written by the PTP shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION 0159_{16}
MAJOR NUMBER								MINOR NUMBER								

10.1.1.2.2 TDMA Message Reception. For a TDMA message received in slot N, the PTP shall transfer the contents of the received message into the designated TDMA received message buffer near the end of slot N+1. The designated received message buffer starting address shall be that specified in the receive buffer address word (see 10.1.1.1.1.22) obtained in slot N+1. The NICP shall read the contents of the receive message buffer after the receipt of the end of slot interrupt for slot N+2. When a message is transmitted by the terminal in slot N, a loopback copy of this message shall be stored in Global Memory by the PTP in slot N+1 and shall be read by the NICP in slot N+2 (see Figure I-XV). Figures I-XVI through I-XXIX depict the received message buffer composition for the various message types and T/M's. The word format of the message portion of the received messages shall be as specified in JINTACCS JTIDS TIDP. The bit designation for the received message status words shall be as follows:

WORDS 1 AND 2

TOA = MEASURED TIME-OF-ARRIVAL (20 BITS)
LSB: 12.5 Nanoseconds
RANGE: 0-13,107,187.5 Nanoseconds

WORD 3

TOTAL ERASURE COUNT = TOTAL ERASURE COUNT OF RECEIVED MESSAGE (9 BITS). IT IS THE SUM OF ALL BLOCK ERASURE COUNTS, INCLUDING THAT OF THE HEADER.

B2 to B13 Block Error

The bit designation for Block Error shall be as follows:

A	B	C D E F
DF 16	DF 13	ERRORS

A = Decode fail greater than 16
B = Decode fail greater than 13
C to F = 4 bits of corrected Block Errors (0 to 15) valid only when A = logic 0

B1 = header block error.
Similar to B2 to B13 except:

A = Decode fail greater than 9

B = Decode fail greater than 6

B2 to B13 = block error for blocks 2 through 13

ME indicates Block Decode Failure (BDF) 16 in at least one FT Reed-Solomon (RS) block.

ME1 indicates BDF 16 in at least one of B2, B3, or B4 of FF RS Blocks or parity failure for 3 block groups.

ME2 indicates BDF 16 in at least one of B5, B6, or B7 of FF RS Blocks or parity failure for 3 block groups.

ME3 indicates BDF 16 in at least one of B8, B9, or B10 of FF RS Blocks or parity failure for 3 block groups.

ME4 indicates BDF 16 in at least one of B11, B12, or B13 of FF RS Blocks or parity failure for 3 block groups.

WORD 4

MESSAGE TYPE AND TYPE MODIFIER (T/M)

MESSAGE	TYPE T/M	BIT	RTT 4	T/M 3	TYPE 2	1	0
STANDARD FT UNCODED	0/0		0	0	0	0	0
PACKED 2 SP-FT UNCODED	0/1		0	1	0	0	0
STANDARD FF CODED	4		0	RI	1	0	0
RTT INTERROGATION TYPE A	2/0		1	0	0	1	0
RTT INTERROGATION TYPE B	2/1		1	1	0	1	0
STANDARD FT CODED	6/0		0	0	1	1	0
PACKED 2 SP-FT CODED	6/1		0	1	1	1	0
PACKED 4 SP-FT UNCODED	1/1		0	1	0	0	1
PACKED 4 SP-FT CODED	2/1		0	1	0	1	0
PACKED 2 DP-FT UNCODED	1/0		0	0	0	0	1
PACKED 2 DP-FT CODED	2/0		0	0	0	1	0
PACKED 2 SP-FF CODED	3		0	RI	0	1	1
PACKED 4 SP-FF CODED	7		0	RI	1	1	1
PACKED 2 DP-FF CODED	5		0	RI	1	0	1

RI = RELAY INDICATOR
LOGIC 1 = RELAY MSG
RTT = RTT INDICATOR
LOGIC 1 = RTT INTERROGATION TYPE MODIFIER
LOGIC 0 = NO RTT (NORMAL MSG)

CT = Catalog Type - This bit is set by the PTP.

LOGIC 1 = The messages was received in an IJMS slot. This value is not used by NAVY.

LOGIC 0 = The message was received in a TADIL J slot.

WORD 5

STN = SOURCE TRACK NUMBER
FIVE OCTAL DIGITS 00000 TO 77777

	D 4	D 3	D 2	D 1	D 0
BITS	14,13,12	11,10,9	8,7,6	5,4,3	2,1,0

Block Erasure Count = number of detected erasures in following message block does not include header erasures (7 bits)

OP = Outer Parity
LOGIC 1 = good outer parity

PTP-TO-NICP DTB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

wd 1														MSB	TOA	
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT													B1		
wd 4	CT													0	0	0 0 0
wd 5		STN														
wd 6	15															0
wd 7	31															16
wd 8	47															32
wd 9	63															48
wd 10	79															64
wd 11	95															80
wd 12	111															96
wd 13	127															112
wd 14	143															128
wd 15	159															144
wd 16	175															160
wd 17	191															176
wd 18	207															192
wd 19	223															208
wd 20	239															224
wd 21	255															240
wd 22	271															256
wd 23	287															272
wd 24	303															288
wd 25	319															304
wd 26	335															320
wd 27	351															336
wd 28	367															352
wd 29	383															368
wd 30	399															384
wd 31	415															400
wd 32	431															416
wd 33	447															432
wd 34	463															448
wd 35																464
wd 36														BLOCK ERASURE COUNT		

FIGURE I-XVI. TYPE 0/0 STANDARD FT (NON-ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT												B1			
wd 4	CT												0	1	0	0	0
wd 5		STN														
wd 6	15															0
wd 7	31															16
wd 8	47															32
:	:															
wd 33	447															432
wd 34	463															448
wd 35																464
wd 36	15															0
wd 37	31															16
wd 38	47															32
wd 39	63															48
:	:															
wd 63	447															432
wd 64	463															448
wd 65																464
wd 66		BLOCK ERASURE COUNT2								BLOCK ERASURE COUNT1						

FIGURE I-XVII. TYPE 0/1 PACKED 2-SP-FT (NON-ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT										B1					
wd 4	CT											0	RI	1 0 0		
wd 5		STN														
wd 6	15															0
wd 7	31															16
wd 8	47															32
wd 9	63															48
wd 10											69					64
wd 11	15															0
wd 12	31															16
wd 13	47															32
wd 14	63															48
wd 15											69					64
wd 16	15															0
wd 17	31															16
wd 18	47															32
wd 19	63															48
wd 20											69					64
wd 21	ME 1		B2							B3						
wd 22			B4													OP

FIGURE I-XVIII. TYPE 4 STANDARD FF (ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT											B1				
wd 4													M S B	HEADER TOA		
wd 5	HEADER TOA															LSB
wd 6													MSB TOA			
wd 7	TOA															LSB
wd 8	TOTAL ERASURE COUNT											B1				
wd 9	CT	DON'T CARE										1	T/ M	0	1	0
wd 10	DON'T CARE															

NOTE: RTT REPLY RECEIVED MESSAGE WORDS 1 THROUGH 5
RTT INTERROGATION LOOPBACK MESSAGE WORDS 6 THROUGH 10

FIGURE I-XIX. RTT REPLY RECEIVED MESSAGE/RTT INTERROGATION LOOPBACK MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT												B1			
wd 4	CT	DON'T CARE										1	T/M	0	1	0
wd 5	DON'T CARE															
wd 6													MSB TOA			
wd 7	TOA															LSB
wd 8	TOTAL ERASURE COUNT												B1			
wd 9	DON'T CARE															
wd 10	DON'T CARE															

NOTE: RTT INTERROGATION RECEIVED MESSAGE WORDS 1 THROUGH 5
RTT REPLY LOOPBACK MESSAGE WORDS 6 THROUGH 10

FIGURE I-XX. RTT INTERROGATION RECEIVED MESSAGE/RTT REPLY LOOPBACK MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT												B1			
wd 4	CT												0	0	1	1	0
wd 5		STN														
wd 6	15															0
wd 7	31															16
wd 8	47															32
wd 9	63															48
wd 10	79															64
wd 11	95															80
wd 12	111															96
wd 13	127															112
wd 14	143															128
wd 15	159															144
wd 16	175															160
wd 17	191															176
wd 18	207															192
wd 19	223															208
wd 20																224
wd 21	ME		B2							B3						
wd 22			B4													

FIGURE I-XXI. TYPE 6/0 STANDARD FT (ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT												B1			
wd 4	CT												0	1	1	1	0
wd 5		STN														
wd 6	15															0
wd 7	31															16
wd 8	47															32
wd 9	63															48
wd 10	79															64
:	:															
wd 17	191															176
wd 18	207															192
wd 19	223															208
wd 20																224
wd 21	15															0
wd 22	31															16
wd 23	47															32
wd 24	63															48
wd 25	79															64
wd 26	95															80
:	:															
wd 33	207															192
wd 34	223															208
wd 35																224
wd 36	ME		B2							B3						
wd 37			B4							B5						
wd 38			B6							B7						

FIGURE I-XXII. TYPE 6/1 PACKED 2-SP-FT (ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT												B1			
wd 4	CT												0 1 0 0 1			
wd 5		STN														
wd 6	15															0
:	:															
wd 34	463															448
wd 35																464
wd 36	15															0
:	:															
wd 64	463															448
wd 65																464
wd 66	15															0
:	:															
wd 94	463															448
wd 95																464
wd 96	15															0
:	:															
wd 124	15															0
wd 125																464
wd 126		BLOCK ERASURE COUNT2								BLOCK ERASURE COUNT 1						
wd 127		BLOCK ERASURE COUNT4								BLOCK ERASURE COUNT 3						

FIGURE I-XXIII. TYPE 1/1 PACKED 4-SP-FT (NON-ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT											B1				
wd 4	CT											0	1	0	1	0
wd 5		STN														
wd 6	15															0
:	:															
wd 19	223															208
wd 20																224
wd 21	15															0
:	:															
wd 34	223															208
wd 35																224
wd 36	15															0
:	:															
wd 49	223															208
wd 50																224
wd 51	15															0
:	:															
wd 64	223															208
wd 65																224
wd 66	ME		B2							B3						
wd 67			B4							B5						
wd 68			B6							B7						
wd 69			B8							B9						
wd 70			B10							B11						
wd 71			B12							B13						

FIGURE I-XXIV. TYPE 2/1 PACKED 4-SP-FT (ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT												B1			
wd 4	CT												0 0 0 0 1			
wd 5		STN														
wd 6	15															0
:	:															
wd 33	447															432
wd 34	463															448
wd 35																464
wd 36	15															0
:	:															
wd 63	447															432
wd 64	463															448
wd 65																464
wd 66		BLOCK ERASURE COUNT 2									BLOCK ERASURE COUNT 1					

FIGURE I-XXV. TYPE 1/0 PACKED 2-DP-FT (NON-ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT											B1				
wd 4	CT											0	0	0	1	0
wd 5		STN														
wd 6	15															0
:	:															
wd 18	207															192
wd 19	223															208
wd 20																224
wd 21	15															0
:	:															
wd 33	207															192
wd 34	223															208
wd 35																224
wd 36	ME		B2							B3						
wd 37			B4							B5						
wd 38			B6							B7						

FIGURE I-XXVI. TYPE 2/0 PACKED 2-DP-FT (ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT											B1				
wd 4	CT											0	RI	0	1	1
wd 5		STN														
wd 6	15															0
:	:															
wd 9	63															48
wd 10											69					64
wd 11	15															0
:	:															
wd 14	63															48
wd 15											69					64
wd 16	15															0
:	:															
wd 19	63															48
wd 20											69					64
wd 21	15															0
:	:															
wd 24	63															48
wd 25											69					64
wd 26	15															0
:	:															
wd 29	63															48
wd 30											69					64
wd 31	15															0
:	:															
wd 34	63															48
wd 35											69					64
wd 36	ME 1		B2							B3						
wd 37	ME 2		B4							B5						OP
wd 37			B6							B7						OP

FIGURE I-XXVII. TYPE 3 PACKED 2-SP-FF (ERROR CODED) RECEIVED MESSAGE

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT											B1				
wd 4	CT											0	RI	1	1	1
wd 5		STN														
wd 6	15															0
:	:															
wd 9	63															48
wd 10											69					64
wd 11	15															0
:	:															
wd 14	63															48
wd 15											69					64
wd 16	15															0
:	:															
wd 19	63															48
wd 20											69					64
wd 21	15															0
:	:															
wd 34	63															48
wd 35											69					64
wd 36	15															0
:	:															
wd 49	63															48
wd 50											69					64
wd 51	15															0
:	:															
wd 64	63															48
wd 65											69					64
wd 66	ME 1		B2								B3					
wd 67	ME 2		B4								B5					OP
wd 68	ME 3		B6								B7					OP
wd 69	ME 4		B8								B9					
wd 70			B10								B11					OP
wd 71			B12								B13					OP

FIGURE I-XXVIII. TYPE 7 PACKED 4-SP-FF (ERROR CODED) RECEIVED MESSAGE˝

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1													MSB TOA			
wd 2	TOA															LSB
wd 3	TOTAL ERASURE COUNT												B1			
wd 4	CT											0	RI	1	0	1
wd 5		STN														
wd 6	15															0
:	:															
wd 9	63															48
wd 10											69					64
wd 11	15															0
:	:															
wd 14	63															48
wd 15											69					64
wd 16	15															0
:	:															
wd 19	63															48
wd 20											69					64
wd 21	15															0
:	:															
wd 24	63															48
wd 25											69					64
wd 26	15															0
:	:															
wd 29	63															48
wd 30											69					64
wd 31	15															0
:	:															
wd 34	63															48
wd 35											69					64
wd 36	ME 1		B2							B3						
wd 37	ME 2		B4							B5						OP
wd 38			B6							B7						OP

FIGURE I-XXIX. TYPE 5 PACKED 2-DP-FF (ERROR CODED) RECEIVED MESSAGE

10.1.1.3 NICP/SICP Data Transfer. Data transfer between the NICP and SICP shall be by means of a generalized data block message whose meaning is derivable from the message itself. The NICP and SICP shall each maintain a set of five buffer starting address words which shall be used for the transfer of data. If there is no data to be transferred for a data block, the buffer starting address for that block shall be set to zero. The first two words of each Data Transmission Block (DTB) shall be control words which shall define the type and amount of data in the block. Each DTB shall be capable of having up to 255 data words. The total number of data words for the five DTBs shall not exceed 300 words. The format of the five buffer starting address words shall be as follows:

DTB STARTING ADDRESS WORDS

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
			ADDRESS												

The bit designation shall be as follows:

BIT	DESIGNATION
0-12	DTB BUFFER STARTING ADDRESS ALL ZEROS = NO DATA TO TRANSFER
13-15	NOT USED

The locations for the DTB starting address words shall be as follows:

NICP TO SICP	HEX LOCATION
DTB NO. 1	0075
DTB NO. 2	0076
DTB NO. 3	0077
DTB NO. 4	0078
DTB NO. 5	0079

SICP TO NICP	HEX LOCATION
DTB NO. 1	0140
DTB NO. 2	0141
DTB NO. 3	0142
DTB NO. 4	0143
DTB NO. 5	0144

NICP/SICP DTB

10.1.1.3.1 DTB Data Format. The general format of the DTB shall be as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CNTRL WD 1	C	A		ACK	ADR1				WC							
CNTRL WD 2	ADR2															
WD 3	TIME TAG WORD															
	DATA WORD 1															
	. . .															
	DATA WORD N															

WORD 1 CONTROL WORD 1

BIT	DESIGNATION
0-7	WORD COUNT FIELD (WC) The WC indicates the total number of words in the data block starting with word 0. Range 1 to 255.
8-11	ADDRESS FIELD (ADR1) Defined in address type field format definition.
12	ACKNOWLEDGE BIT (ACK) This bit shall be used by the recipient of the DTB to indicate that the data has been accepted (ACK=LOGIC 1).

BIT	DESIGNATION
13-14	ADDRESS TYPE FIELD (A) This two-bit field shall define how the ADR1 and ADR2 fields are to be interpreted. 00 Indicates that address in ADR2 is a virtual address and ADR1 is a don't care field. 01 Indicates that the address is a physical address and ADR1 and ADR2 concatenated (ADR1 contains the most significant position) comprise the total address. 10 Indicates that ADR1 is the data category, and ADR2 is a coded data specifier. The data category shall be as shown in Table I-I. 11 Not used
15	COMMAND BIT (C) The command Bit shall indicate to the recipient whether the DTB is a request for data (C = LOGIC 1) or is a response or unsolicited output (C = LOGIC 0).

WORD 2 CONTROL WORD 2

BIT	DESIGNATION
15-0	DATA ADDRESS FIELD (ADR2) Defined in the description of the address type field.

WORD 3 TIME TAG WORD

BIT	DESIGNATION
15-0	TIME OF DATA VALIDITY -32768 to 32767 slots The SICP and NICP shall maintain synchronized slot counters for time correlation.

TABLE I-I. DTB DATA CATEGORIES

ADR1, ADR2	ADR1	ADR2	DESCRIPTION	PARAGRAPH
0,0	0000	0000	MESSAGE TO TRANSMIT (SICP TO NICP)	10.1.1.3.1.1
0,1	0000	0001	IJMS VDL FOR TRANSMIT (SICP TO NICP) NOT USED BY NAVY	10.1.1.3.1.2
1,0	0001	0000	RECEIVED MESSAGE/LOOPBACK TRANSMISSION (NICP TO SICP)	10.1.1.3.1.3
2,1	0010	XXX1	D/R NAV DATA (SICP TO NICP)	10.1.1.3.1.4.1
2,2	0010	XX1X	GEODETIC POSITION FIX DATA (SICP TO NICP)	10.1.1.3.1.4.2
2,4	0010	X1XX	EXTERNAL TIME REFERENCE DATA (SICP TO NICP)	10.1.1.3.1.4.3
2,8	0010	1XXX	UTM/UPS DATA (SICP TO NICP)	10.1.1.3.1.4.4
2,16	0010	10000	START-UP NAV DATA (SICP TO NICP)	10.1.1.3.1.4.5
3,0	0011	0000	NAV DATA FROM NICP (NICP TO SICP)	10.1.1.3.1.5
4,0	0100	0000	BI-DIRECTIONAL INITIALIZATION DATA	10.1.1.3.1.6.1
4,1	0100	0001	NICP INITIALIZATION DATA STATUS RESPONSE (NICP TO SICP)	10.1.1.3.1.6.2
5,0	0101	0000	NPG MAPPING STATUS (NICP TO SICP)	10.1.1.3.1.7.1
5,1	0101	0001	REAL TIME SLOT ASSIGNMENT SEQUENCE (NICP TO SICP)	10.1.1.3.1.7.2
5,2	0101	0010	MESSAGE STATUS (NICP TO SICP)	10.1.1.3.1.7.3
5,3	0101	0011	NICP 12-SECOND STATUS REPORT (NICP TO SICP)	10.1.1.3.1.7.4
5,4	0101	0100	SICP STATUS REPORT (SICP TO NICP)	10.1.1.3.1.7.5

TABLE I-I. (continued)

ADR1, ADR2	ADR1	ADR2	DESCRIPTION	PARAGRAPH
7,1	0111	0001	SYNCHRONIZATION FILTER DATA (NICP TO SICP)	10.1.1.3.1.8.1
7,2	0111	0010	REL NAV KALMAN FILTER STATE VECTOR AND COVARIANCE DIAGONAL (NICP TO SICP)	10.1.1.3.1.8.2
7,4	0111	0100	REL NAV KALMAN FILTER OBSERVATION DATA (NICP TO SICP)	10.1.1.3.1.8.3

10.1.1.3.1.1 Message to Transmit. The TADIL J Message to Transmit DTB shall be used to transfer single messages or multiple messages. The format that follows is for fixed format TADIL J messages.

TADIL J Message to Transmit DTB:

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	0	0	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wd 2	TIME TAG															
wd 3	IND	MSG. TYPE		MSG	SERIAL ID NUMBER											
wd 4	CT	NPG (INT)					LENGTH			PACK					DATA TYPE	
wd 5	TIME SLOT														XSET	
wd 6	PRIORITY															
wd 7	STALENESS															
wd 8	EX	NAV DATA AGE														
wd 9	ACTION						HOP COUNT					RR/R/C CODE				
wd 10	R/C CHECKSUM															
wd 11																
wd 12		STN														
wd 13	15															0
wd 14	31															16
wd 15	47															32
wd 16	63															48
wd 17										69						64
. . .	. . .															
N	15															0
N+1	31															16
N+2	47															32
N+3	63															48
N+4										69						64
. . .	NOTE: FORMAT SHOWN IS FOR FIXED FORMAT MESSAGES (12 70-BIT BLOCKS MAXIMUM). FOR NON-ERROR CODED FREE TEXT, THE BLOCKS ARE 465 BITS LONG (4 BLOCKS MAXIMUM). FOR ERROR CODED FREE TEXT, THE BLOCKS ARE 225 BITS LONG (4 BLOCKS MAXIMUM).															

0,0 DTB

The bit designation shall be as follows:

WORD 3 MESSAGE ID (LOOPBACK TAG)

BIT	DESIGNATION
0-11	SERIAL ID NO. WHEN BIT 12 = 1: 0 = SICP CANTPRO >0 = HOST R/C RESPONSE ID WHEN BIT 12 = 0 and BITS 13-14 = 00 or 11 ID NO. = TSR LOOPBACK INDEX NO. WHEN BIT 12 = 0 and BITS 13-14 = 01 or 10 ID NO. = HOST or PANEL LOOPBACK ID
12	MESSAGE ID TYPE 0 = ORIGINAL HOST or PANEL or TSR MESSAGE 1 = SICP CANTPRO or HOST R/C RESPONSE (BITS 13 and 14 ARE DONT CARE)
13-14	ORIGINAL MESSAGE TYPE 00 = HOST or PANEL GENERATED TSR ANNOUNCEMENT 01 = PANEL INITIATED COMMON CARRIER MESSAGE 10 = HOST INITIATED COMMON CARRIER MESSAGE (MUX) 11 = SICP GENERATED TSR ANNOUNCEMENT MESSAGE
15	SICP/NICP INDICATOR 0 = NICP GENERATED MESSAGE 1 = SICP GENERATED MESSAGE

0,0 DTB

WORD 4

BIT	DESIGNATION
0-1	DATA TYPE

BIT 1 0

0	0	FREE TEXT UNCODED
0	1	FREE TEXT CODED
1	0	FIXED FORMAT
1	1	VARIABLE MESSAGE FORMAT (NOT USED BY NAVY)

2-3	NOT USED
4-5	PACKING LIMIT

BIT 5 4

0	0	STANDARD
0	1	PACKED-2 DP
1	0	PACKED-2 SP
1	1	PACKED 4

6-9 LENGTH
NUMBER OF TADIL J WORDS OR FT BLOCKS IN MESSAGE

10-14	5 BIT (INTERNAL) NPG NUMBER
15	CATALOG TYPE (CT) LOGIC 1 = IJMS DTB (NOT USED BY NAVY) LOGIC 0 = TADIL J

WORD 5

BIT	DESIGNATION
0-1	SET FOR TRANSMISSION OF MESSAGE (XSET)

2-15 TIME SLOT FOR TRANSMISSION OF MESSAGE WITHIN THE NEXT HALF EPOCH: 0 - 16,383

0,0 DTB

WORD 6

BIT	DESIGNATION
0-15	PRIORITY OF MESSAGE - USED FOR MESSAGE TRANSMISSION PACKING LOGIC. HEX'4800' PRIORITY FOR INITIAL ENTRY SLOT GROUP HEX'4400' PRIORITY FOR REPROMULGATION HEX'4000' PRIORITY FOR CHECKSUM-FORMAT R/C RESPONSES HEX'2800' PRIORITY FOR PAIRED SLOT RELAYS HEX'2000' PRIORITY FOR FULL-MESSAGE HOST R/C RESPONSES (NAVY AIR ONLY) HEX'1FFF' MAXIMUM PRIORITY FOR SICP TSR MESSAGE HEX'1400' PRIORITY FOR PPLIs

NOTE: When the SICP creates a TSR (J0.7) message, it inserts a priority value of $1FF_{16}$.

WORD 7

BIT	DESIGNATION
0-15	STALENESS LIMIT (1-65,535) TIME, IN SYSTEM TIME, (i.e., TIME DERIVED FROM THE OPERATING SYSTEM) WHEN THE MESSAGE SHOULD BE DELETED FROM THE NPG QUEUE.

WORD 8

BIT	DESIGNATION
0-14	NUMBER OF SLOTS (VALID AT TIME DEFINED BY WORD 2) SINCE NAV DATA WAS VALID (0-32767)
15	EXTRAPOLATION REQUIRED LOGIC 1 = EXTRAPOLATION REQUIRED

WORD 9

BIT	DESIGNATION
0-4	R/C CODE (0-31) IF ACTION = 'X010' ONLY (OR) RECURRENCE RATE (0-15)
5-8	HOP COUNT (1-15)
9-10	NOT USED
11	NOT USED

0,0 DTB

WORD 9 (continued)

BIT	DESIGNATION
12-15	ACTION REQUIRED AS FOLLOWS:

BIT 15	14	13	12	
0	0	0	0	NO SPECIAL ACTION REQUIRED
0	0	0	1	R/C ORIGINAL MESSAGE (R/C1,31)
0	0	1	0	R/C RESPONSE - R/C CODE AND CHECKSUM VALID
0	0	1	1	NOT USED
0	1	0	0	VMF REPROMULGATION RELAY-RR ONLY VALID
0	1	0	1	NOT USED
0	1	1	0	NOT USED
0	1	1	1	NOT USED
1	X	X	X	NON-VMF REPROMULGATION REQUEST-HOP COUNT AND RECURRENCE RATE VALID

WORDS 10 AND 11

32-BIT R/C CHECKSUM (COMPUTED BY SETTING TO ZERO ALL FIELDS THAT CHANGE FOR AN R/C TRANSACTION) BOOLEAN CHECKSUM COMPUTATION SHALL BE UTILIZED. R/C CODE, R/C RR AND R/C ATN ARE EXCLUDED FROM THE R/C CHECKSUM CALCULATION.

WORD 12

BIT	DESIGNATION
0-14	STN
15	NOT USED

WORDS 13 THROUGH (13+LENGTH.BLOCKSIZE)

TADIL J CODE WORDS OR FT BLOCKS (MESSAGE 1)

0,0 DTB

10.1.1.3.1.2 IJMS Variable Data Label (VDL) for Transmit (SICP to NICP). This DTB shall be used to transfer variable data to the NICP to be appended to "P" messages for transmission:

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	ACK	0	0	0	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
wd 2	TIME TAG															
wd 3	RESERVED															
wd 4	RESERVED											VDL		VD		
wd 5	VARIABLE DATA (VD)															
wd 6	VD															
wd 7	VD															
wd 8	VD													RESERVED		

This bit designation shall be as follows:

WORD 3

BIT	DESIGNATION
0-15	RESERVED

WORD 4

BIT	DESIGNATION
0-2	VARIABLE DATA (VD)
3-6	VARIABLE DATA LABEL (VDL)
7-15	RESERVED

WORDS 5-7

BIT	DESIGNATION
0-15	VARIABLE DATA (VD)

WORD 8

BIT	DESIGNATION
0-2	RESERVED
3-15	VARIABLE DATA (VD)

10.1.1.3.1.3 Received Message/Loopback Transmission. The message DTB format (NICP to SICP) shall be as follows:

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	0	0	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wd 2	TIME TAG															
wd 3	XMIT NPG						RCVTAG			LBSTAT			NO. VAL MSG			
wd 4	CT			SAE NUMBER							TQSTAT					
wd 5	TOA															
wd 6	TOA															
wd 7	TOTAL ERASURE COUNT										B1					
wd 8	CTP LCN				CTP CNTL				RCV ANT	DLB I		T/M	MESSAGE TYPE			
wd 9		STN														
wd 10 . N	MESSAGE															

NOTE: WORDS 10 THROUGH N - RECEIVED AND/OR LOOPBACK MESSAGE (INCLUDING EITHER BLOCK ERROR OR BLOCK ERASURE COUNT)

-OR-

wd 8									R C V A N T	D L B I		MSB	HEADER TOA			
wd 9	HEADER TOA															LSB
wd 10											MSB	TOA				
wd 11	TOA															LSB
wd 12	TOTAL ERASURE COUNT									B1						
wd 13	C T	DON'T CARE									T / M	0	1	0		
N=14	DON'T CARE															

NOTE: WORDS 8 THROUGH N=14 - VALID ONLY FOR RTT REPLY RECEIVED MESSAGE/RTT INTERROGATION LOOPBACK MESSAGE

1,0 DTB

10.1.1.3.1.3 Received Message/Loopback Transmission. (continued)

-OR-

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 8	CT									RCVANT	DLBI		T/M	0	1	0
wd 9																
wd 10													MSB TOA			
wd 11	TOA															
wd 12	TOTAL ERASURE COUNT										B1					
wd 13																
N=14																
N+1	LOOPBACK ID TAG 1/MSGPTR (1)															
N+2	LOOPBACK ID TAB 2/MSGPTR (2)															
. .	. .															
N+M	LOOPBACK ID TAB M (M 12)/MSGPTR (M) (M 12)															
N+M+1 N+M+2	CHECKSUM															

NOTE: WORDS 8 THROUGH N=14 - VALID ONLY FOR RTT INTERROGATION RECEIVED MESSAGE/RTT REPLY LOOPBACK MESSAGE

WORDS N+1 THROUGH N+M - VALID ONLY IF RCVTAG = 0, 2, 4, OR 8.

WORDS N+M+1 AND N+M+2 - VALID IF RCVTAG = 0, 4.

10.1.1.3.1.3.1 The bit designation shall be as follows:

WORD 2

BIT	DESIGNATION
0-15	TIME TAG TIME TAG IS TWO (2) SLOTS AFTER THE TIME THE MESSAGE WAS RECEIVED AT THE ANTENNA.

1,0 DTB

WORD 3

BIT	DESIGNATION
0-3	NUMBER OF VALID MESSAGES (NO. VAL MSG) M = NUMBER OF VALID FF MESSAGES IF RCVTAG = 0, 2, 4 OR M = NUMBER OF LOOPBACK ID TAGS IF RCVTAG = 8.
4-6	STATUS OF LOOPBACK TRANSMISSION (LBSTAT)

BIT 6	5	4	
0	0	0	TRANSMITTED - NO ERRORS
0	0	1	HEADER OR BLOCK DECODE FAIL OR OUTER PARITY FAIL
0	1	0	TOA COMPARISON FAIL
0	1	1	NO LOOPBACK RECEIVED
1	0	0	NOT USED
.	.	.	
1	1	1	NOT USED

7-10	RECEIVED MESSAGE TAG (RCVTAG) THE 4 MSBS OF THE RECEIVED MESSAGE TAG

BIT 10	9	8	7	
0	0	0	0	RECEIVED MSG - NO ERRORS
0	0	0	1	RECEIVED MSG - HEADER DECODE FAIL
0	0	1	0	RECEIVED MSG - BLOCK ERRORS
0	0	1	1	NOT USED
0	1	0	0	RECEIVED MSG - DUPLICATE
0	1	0	1	RECEIVED RTT REPLY/ INTERROGATION LOOPBACK
0	1	1	0	RECEIVED RTT INTERROGATION /REPLY LOOPBACK
0	1	1	1	NON-DECRYPTABLE PVM
1	0	0	0	RECEIVED LOOPBACK
1	0	0	1	RESERVED FOR FUTURE
.	.	.	.	
1	1	1	1	RESERVED FOR FUTURE

11-15	TRANSMIT NPG (XMIT NPG) TRANSMIT NPG (INTERNAL) ASSOCIATED WITH SLOT OF TRANSMISSION

1,0 DTB

WORD 4

BIT	DESIGNATION
0-5	TRANSMISSION QUEUE STATUS (TQSTAT) THE NUMBER OF SPACES AVAILABLE FOR MESSAGES IN THE NICP RANGE: 0 TO 48
6-12	TIME SLOT BLOCK INDEX (SAE NUMBER) TIME SLOT BLOCK INDEX ASSOCIATED WITH THE SLOT OF RECEPTION/TRANSMISSION (64 = UNASSIGNED SLOT) RANGE: 0 TO 64
13-14	NOT USED
15	CATALOG TYPE (CT) LOGIC 1 = IJMS SLOT (NOT USED BY NAVY) LOGIC 0 = TADIL J

WORDS 5 AND 6

BIT	DESIGNATION
0-15	TOA UNITS: REAL NANOSECONDS

WORD 7

BIT	DESIGNATION
0-5	BLOCK 1 (B1) HEADER BLOCK ERROR FOR BLOCK 1 (B1). FIELD DEFINITION IS AS PROVIDED IN 10.1.1.2.2.
6	NOT USED
7-15	TOTAL ERASURE COUNT OF RECEIVED MESSAGE

WORD 8

BIT	DESIGNATION
0-3	MESSAGE TYPE AND TYPE MODIFIER (TYPE AND T/M) FIELD VALUES FOR VARIOUS MESSAGES ARE DEFINED IN 10.1.1.2.2.
4	NOT USED
5	DIGITAL LOOPBACK INDICATOR (DLBI) LOGIC 1 = NORMAL MODE LOGIC 0 = DIGITAL LOOPBACK MODE

1,0 DTB

WORD 8 (CONTINUED)

BIT	DESIGNATION
6	RECEIVE ANTENNA (RCVANT) RECEIVE ANTENNA INDICATES AT WHICH ANTENNA THE MESSAGE WAS RECEIVED. LOGIC 1 = ANTENNA B LOGIC 0 = ANTENNA A
7	NOT USED
8-9	CYPHER TEXT PROCESSOR CONTROL (CTP CNTL) THIS FIELD DEFINES WHEN THE CTP CONTROL IS VALID. BIT 9 8 0 0 RELAY TAG IS VALID 0 1 RELAY TAG IS NOT VALID, DEFAULT 1 0 DECODE FAILURE OCCURRED 1 1 BUFFER IS FULL
10	NOT USED
11-15	CYPHER TEXT PROCESSOR BUFFER LOCATION (CTP LCN)

1,0 DTB

WORD 9

BIT	DESIGNATION
0-14	SOURCE TRACK NUMBER (STN) FIVE OCTAL DIGITS

	D 4	D 3	D 2	D 1	D 0
BITS	14,13,12	11,10,9	8,7,6	5,4,3	2,1,0

15	NOT USED

WORDS 10 TO N

THE RECEIVED AND/OR LOOPBACK MESSAGE BLOCK INCLUDING: MESSAGE BODY, AND EITHER BLOCK ERROR OR BLOCK ERASURE COUNTS (SEE 10.1.1.2.2).

--OR--

THE BIT DESIGNATIONS FOR WORDS 8 THROUGH 14 FOR AN RTT REPLY RECEIVED MESSAGE/RTT INTERROGATION LOOPBACK MESSAGE SHALL BE AS FOLLOWS

WORD 8

BIT	DESIGNATION
0-2	THREE (3) MSB'S OF NINETEEN (19) BIT HEADER TOA FIELD. REMAINING SIXTEEN (16) BITS ARE CONTAINED IN WORD 9.
3-4	NOT USED
5	DIGITAL LOOPBACK INDICATOR (DLBI) LOGIC 1 = NORMAL MODE LOGIC 0 = DIGITAL LOOPBACK MODE
6	RECEIVE ANTENNA (RCV ANT) - INDICATES AT WHICH ANTENNA THE MESSAGE WAS RECEIVED LOGIC 1 = MESSAGE RECEIVED ON ANTENNA B LOGIC 0 = MESSAGE RECEIVED ON ANTENNA A
7-15	NOT USED

1,0 DTB

WORD 9

BIT	DESIGNATION
0-15	SIXTEEN (16) LSB'S OF NINETEEN (19) BIT HEADER TOA FIELD. LSB: 12.5 Nanoseconds.

WORD 10

BIT	DESIGNATION
0-3	FOUR (4) MSB'S OF TWENTY (20) BIT TOA FIELD. REMAINING SIXTEEN (16) BITS ARE CONTAINED IN WORD 11.
4-15	NOT USED

WORD 11

BIT	DESIGNATION
0-15	SIXTEEN (16) LSB'S OF TWENTY (20) BIT TOA FIELD. LSB: 12.5 Nanoseconds.

WORD 12

BIT	DESIGNATION
0-5	HEADER BLOCK ERROR (B1). FIELD DEFINITION IS AS PROVIDED IN 10.1.1.2.2.
6	NOT USED
7-15	TOTAL ERASURE COUNT OF RECEIVED MESSAGE.

WORD 13

BIT	DESIGNATION
0-2	MESSAGE TYPE FIELD VALUE SHALL BE SET TO 010 BINARY.

1,0 DTB

BIT	DESIGNATION
3	TYPE MODIFIER (T/M) FIELD VALUE IS AS DEFINED IN 10.1.1.2.2.
4-14	NOT USED
15	CATALOG TYPE LOGIC 1 = IJMS SLOT (NOT USED BY NAVY) LOGIC 0 = TADIL J

WORD 14

BIT	DESIGNATION
0-15	NOT USED

--OR--

THE BIT DESIGNATIONS FOR WORDS 8 THROUGH 14 FOR AN RTT INTERROGATION RECEIVED MESSAGE/RTT REPLY LOOPBACK MESSAGE SHALL BE AS FOLLOWS:

WORD 8

BIT	DESIGNATION
0-2	MESSAGE TYPE FIELD VALUE SHALL BE SET TO (010)BINARY.
3	TYPE MODIFIER (T/M) FIELD VALUE IS AS DEFINED IN 10.1.1.2.2.
4	NOT USED
5	DIGITAL LOOPBACK INDICATOR (DLBI) LOGIC 1 = NORMAL MODE LOGIC 0 = DIGITAL LOOPBACK MODE
6	RECEIVE ANTENNA (RCV ANT) INDICATES AT WHICH ANTENNA THE MESSAGE WAS RECEIVED. LOGIC 1 = MESSAGE RECEIVED ON ANTENNA B LOGIC 0 = MESSAGE RECEIVED ON ANTENNA A
7-14	NOT USED
15	CATALOG TYPE LOGIC 1 = IJMS SLOT (NOT USED BY NAVY) LOGIC 0 = TADIL J

WORD 9

BIT	DESIGNATION
0-15	NOT USED

1,0 DTB

WORD 10

BIT	DESIGNATION
0-3	FOUR (4) MSB'S OF TWENTY (20) BIT TOA FIELD. REMAINING SIXTEEN (16) BITS ARE CONTAINED IN WORD 11.
4-15	NOT USED

WORD 11

BIT	DESIGNATION
0-15	SIXTEEN (16) LSB'S OF TWENTY (20) BIT TOA FIELD. LSB: 12.5 Nanoseconds.

WORD 12

BIT	DESIGNATION
0-5	HEADER BLOCK ERROR (B1). FIELD DEFINITION IS AS PROVIDED IN 10.1.1.2.2.
6	NOT USED
7-15	TOTAL ERASURE COUNT OF RECEIVED MESSAGE.

WORD 13

BIT	DESIGNATION
0-15	NOT USED

WORD 14

BIT	DESIGNATION
0-15	NOT USED

WORDS N+1 to N+M

IF RCVTAG=8, THE M LOOPBACK ID MESSAGE TAGS (0,0 DTB), (SEE DESCRIPTION FOR MESSAGE TAG IN WORD 3 OF TADIL J MESSAGE TO TRANSMIT DTB). OTHERWISE THE M ERROR FREE FF MESSAGE BUFFER POINTERS (MSGPTR) WHICH POINT TO THE LOCATIONS OF THE START OF M MESSAGES. (VALID IF RCVTAG = 0,2,4) WHERE M = NUMBER OF VALID MESSAGES (WORD 3, BITS 0-3). EACH BUFFER POINTER SHALL INDEX THE DTB WORD CONTAINING THE START OF THE INITIAL CODEWORD OF EACH VALID ERROR FREE FF MESSAGE. INVALID MESSAGES IN THE DTB DO NOT HAVE MESSAGE POINTER LOCATIONS.

WORDS N+M+1 AND N+M+2

A 32-BIT INTEGER CHECKSUM OF THE RECEIVED MESSAGE BODY - VALID IF RCVTAG=0. BOOLEAN CHECKSUM COMPUTATION SHALL BE UTILIZED.

1,0 DTB ˝

10.1.1.3.1.4 NAV Data from SICP. The NAV Data from SICP DTB shall provide the following data.

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	0	1	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	X	X	X	X
wd 2 . . . wd 40	D/R NAV DATA 39 WORDS															
wd 41 . . . wd 52	GEODETIC POSITION FIX DATA 12 WORDS															
wd 53 . . . wd 59	EXTERNAL TIME REFERENCE DATA 7 WORDS															
wd 60 . . . wd 65	UTM/UPS DATA 6 WORDS															

∀ D/R NAV DATA VALID WHEN BIT 0 OF ADR2 = 1

∀ D/R NAV DATA SHALL BE SENT FOR THE INERTIAL AND NON-INERTIAL D/R NAV PLATFORMS. THE D/R NAV DATA AVAILABILITY SHALL CONTROL THE RELEASE TIME OF THE BLOCK.

∀ GEO FIX DATA VALID WHEN BIT 1 OF ADR2 = 1

∀ EXTERNAL TIME REFERENCE DATA VALID WHEN BIT 2 OF ADR2 = 1

∀ UTM/UPS DATA VALID WHEN BIT 3 OF ADR2 = 1

∀ DATA SHALL NOT BE PROVIDED WHEN CORRESPONDING BIT OF ADR2 = 0: WORD NUMBERS SHALL BE ADJUSTED ACCORDINGLY

∀ THE LENGTH OF THE BLOCK SHALL BE EQUAL TO THE SUM OF THE WORDS OF EACH VALID SUB-BLOCK PLUS TWO. 66 IS THE MAXIMUM WORD COUNT.

2,1 DTB

10.1.1.3.1.4.1 D/R NAV Data. The D/R NAV Data portion of the NAV Data from SICP DTB shall be as follows:

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	0	1	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	X	X	X	1
wd 2	D/R TIME TAG															
wd 3	D/R INTRACYCLE TIME															
wd 4	D/R VALIDITY WORD															
wd 5-6	LATITUDE															
wd 7-8	LONGITUDE															
wd 9-10	ALTITUDE															
wd 11-12	X SPEED															
wd 13-14	Y SPEED															
wd 15-16	Z SPEED															
wd 17-18	X-AXIS AZIMUTH															
wd 19-20	V_X															
wd 21-22	V_Y															
wd 23-24	V_Z															
wd 25-26	x															
wd 27-28	y															
wd 29-30	z															
wd 31-32	X SLEW ANGLE															
wd 33-34	Y SLEW ANGLE															
wd 35-36	Z SLEW ANGLE OR VERTICAL VELOCITY UNCERTAINTY†															
wd 37	LEVER ARM X COMPONENT															
wd 38	LEVER ARM Y COMPONENT															
wd 39	LEVER ARM Z COMPONENT															
wd 40	UNCERTAINTY WORD (HORIZONTAL†)															

† ONLY VALID FOR GPS AIDED NAV SYSTEMS

2,1 DTB

WORD 2 TIME TAG 16-BIT SIGNED INTEGER

RANGE: -32768 to +32767
LSB: 7.8125 x 10**-3 (one slot)
UNITS: Seconds
DEFINITION: Time tag of slot during which data is valid.

WORD 3 D/R INTRACYCLE TIME 16-BIT SIGNED FIXED POINT

RANGE: -32768 to +32767
LSB: 7.8125 x 10**-6
UNITS: seconds
REPRESENTED RANGE: ±256 milliseconds
DEFINITION: Time of validity of D/R data with respect to the slot interrupt at the beginning of the time tag slot

WORD 4 D/R VALIDITY WORD 16 CHECK BITS

LOGIC 0 = INVALID
LOGIC 1 = VALID

BIT	ASSOCIATED DATA
0	LATITUDE
1	LONGITUDE
2	ALTITUDE
3	X AND Y SPEEDS
4	Z SPEED
5	X-AXIS AZIMUTH
6	V_X, V_Y, AND V_Z
7	x, y, AND z
8	X, Y, AND Z-AXIS SLEW
9	LEVER ARM
10-11	RESERVED FOR SICP USE
12-13	DAMPING MODE

CODING	MODE
0	NO DAMPING
1	FREE INERTIAL
2	DAMPED MODE 1
3	DAMPED MODE 2

14-15 NAV STATE

CODING	STATE
0	START UP WITH D/R
1	NORMAL
2	FLYWHEEL
3	NOT USED

NOTE: X AND Y SPEEDS VALIDITY IS RELEVANT ONLY IF DAMPING MODE IS NO DAMPING. OTHERWISE, BIT 3 SHALL BE SET TO INVALID.

2,1 DTB

WORDS 5-6 LATITUDE BAM

DEFINITION: D/R latitude estimate valid at intracycle time. Also used to provide latitude set-point for non-inertial systems able to provide it.

WORDS 7-8 LONGITUDE BAM

DEFINITION: D/R longitude estimate valid at intracycle time.

WORDS 9-10 ALTITUDE REAL

UNITS: Feet
DEFINITION: NAV system estimate of MSL altitude valid at intracycle time

2,1 DTB

WORDS 11-12 X SPEED REAL

UNITS: Feet per second
DEFINITION: System estimate of speed in X direction (if NAV State is START UP or Damped Mode is NO DAMPING).

Reference speed in X direction (if NAV state is not START UP and Damped Mode is not NO DAMPING)

X, Y, Z are local vertical earth- referenced coordinates, nominally north, west, up respectively, when X-axis azimuth is 0.0 degrees

WORDS 13-14 Y SPEED REAL

UNITS: Feet per second
DEFINITION: System estimate of speed in Y direction (if NAV State is START UP or Damped Mode is NO DAMPING).

Reference speed in Y direction (if NAV State is not START UP and Damped Mode is not NO DAMPING)

WORDS 15-16 Z SPEED REAL

UNITS: Feet per second
DEFINITION: System estimate of speed in Z direction

WORDS 17-18 X-AXIS AZIMUTH BAM

DEFINITION: Direction of X axis with respect to true north, positive is counterclockwise

WORDS 19-20 ΔV_X REAL

UNITS: Feet per second
DEFINITION: Inertial change in X direction speed since previous D/R time of validity

WORDS 21-22 ΔV_Y REAL

UNITS: Feet per second
DEFINITION: Inertial change in Y direction speed since previous D/R time of validity.

2,1 DTB

WORDS 23-24 ΔV_Z REAL

UNITS: Feet per second
DEFINITION: Inertial change in Z direction speed since previous D/R time of validity.

WORDS 25-26 Ωx REAL

UNITS: Radians per second
DEFINITION: Total torquing rate about X axis

WORDS 27-28 Ωy REAL

UNITS: Radians per second
DEFINITION: Total torquing rate about Y axis.

WORDS 29-30 Ωz REAL

UNITS: Radians per second
DEFINITION: Total torquing rate about Z axis.

WORDS 31-32 X SLEW ANGLE BAM

DEFINITION: Applied correction about D/R X axis

WORDS 33-34 Y SLEW ANGLE BAM

DEFINITION: Applied correction about D/R Y axis

WORDS 35-36 Z SLEW ANGLE BAM

DEFINITION: Applied correction about D/R Z axis

OR

WORD 36 VERITCAL VELOCITY UNCERTAINTY (VVU)
BITS 0-4 ONLY

DEFINITION: One sigma uncertainty in vertical component of velocity

CODING:
0 - Uncertainty is greater than 300 feet/sec
1-31 Reported value is the greatest number for which 400X0.75 (VVU) feet/sec is greater than or equal to the vertical velocity.

2,1 DTB

WORDS 37-39 LEVER ARM WORDS NOT USED BY NAVY AIR
TWO's COMPLEMENT

DEFINITION: (lx, ly, lz) define the components of the lever arm from the NAV system in use to antenna A (Bits 0-7) and antenna B (Bits 8-15) in platform X, Y and Z coordinates.
DESCRIPTION: 8 bits in two's complement
MSB: -1024
LSB: 8
UNITS: Feet
RANGE: -1024 to 1016

WORD 40 UNCERTAINTY WORD

BITS	DESIGNATION
0-4	HORIZONTAL POSITION UNCERTAINTY (PU) DEFINITION: ONE-SIGMA UNCERTAINTY IN LATITUDE AND CODING: 0 UNCERTAINTY IS GREATER THAN 60,000 FEET. 1-31 REPORTED VALUE IS THE GREATEST NUMBER FOR POSITION UNCERTAINTY. (SEE TABLE V-I).
5-9	HEIGHT UNCERTAINTY (HU) DEFINITION: ONE-SIGMA UNCERTAINTY IN HEIGHT. CODING: 0 UNCERTAINTY IS GREATER THAN 60,000 FEET. 1-31 REPORTED VALUE IS THE GREATEST NUMBER FOR WHICH 60,000 x 1.575**(1-HU) FEET IS GREATER THAN OR EQUAL TO THE HEIGHT UNCERTAINTY. (SEE TABLE V-I).
10-14	HORIZONTAL VELOCITY UNCERTAINTY (HVU) DEFINITION: ONE-SIGMA UNCERTAINTY IN HORIZONTAL CODING: 0 UNCERTAINTY IS GREATER THAN 300 FEET/SEC. 1-31 REPORTED VALUE IS THE GREATEST NUMBER FOR WHICH 400 x 0.75**(HVU) FEET/SEC IS GREATER THAN OR EQUAL TO THE HORIZONTAL VELOCITY UNCERTAINTY.
15	SPARE

2,1 DTB

10.1.1.3.1.4.2 Geodetic Position Fix Data. The Geodetic Position Fix portion of the NAV Data from SICP DTB shall be formatted as follows:

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	0	1	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	X	X	1	X
. . .	. . .															
wd 41	TIME TAG															
wd 42	INTRACYCLE TIME															
wd 43-44	LATITUDE OF FIX															
wd 45-46	LONGITUDE OF FIX															
wd 47-48	ALTITUDE OF FIX															
wd 49-50	POSITION VARIANCE															
wd 51-52	ALTITUDE VARIANCE															
. . .	. . .															

WORD 41 TIME TAG 16-BIT SIGNED INTEGER

RANGE: -32768 to +32767
LSB: 7.8125 x 10**-3 (one slot)
UNITS: Seconds

DEFINITION: Time tag of slot during which data is valid.

WORD 42 INTRACYCLE TIME 16-BIT, SIGNED FIXED-POINT

RANGE: -32768 to +32767
LSB: 7.8125 x 10**(-6)
UNITS: Seconds
REPRESENTED RANGE: ±256 milliseconds
DEFINITION: Time of validity of fix with respect to the slot interrupt at the beginning of the time tag slot

WORDS 43-44 LATITUDE OF FIX BAM

DEFINITION: Latitude of observed position

WORDS 45-46 LONGITUDE OF FIX BAM

DEFINITION: Longitude of observed position

2,2 DTB

WORDS 47-48 ALTITUDE OF FIX REAL

UNITS: Feet
DEFINITION: Observed Altitude
VALIDITY: Invalid if Altitude Variance is negative

2,2 DTB

WORDS 49-50 POSITION VARIANCE REAL

UNITS: Feet-squared
DEFINITION: One-sigma estimate for total position error in latitude and longitude

WORDS 51-52 ALTITUDE VARIANCE REAL

UNITS: Feet-squared
DEFINITION: One-sigma estimate for error in altitude

2,2 DTB

10.1.1.3.1.4.3 External Time Reference Data. The External Time Reference Data portion of the NAV data from SICP DTB shall be formatted as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	0	1	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	X	1	X	X
. . .	. . .															
wd 53	TIME TAG															
wd 54	0	0	0	0	0	HOURS					MINUTES					
wd 55	0	0	0	SECONDS						SLOTS						
wd 56-57	PHASE REFERENCE UNCERTAINTY															
wd 58-59	INTRASLOT TIME															
. . .	. . .															

WORD 53 TIME TAG 16-BIT SIGNED INTEGER

RANGE: -32768 to +32767
LSB: 7.8125 x 10**-3 (one slot)
UNITS: Seconds
DEFINITION: Time tag of slot during which data is valid.

WORDS 54-55 TIME CHRONOMETER FORMAT

RANGE/UNITS: 0-23 hours, 0-59 minutes,
0-59 seconds, 0-127 slots
DEFINITION: Time of day for the time strobe at or near the time tag slot

WORDS 56-57 PHASE REFERENCE UNCERTAINTY REAL

UNITS: Nanosecond squared
DEFINITION: One-sigma covariance of phase error of any time strobe. (No strobe-to-strobe correlation characteristics are assumed. Successive strobes are likely to be highly correlated.)

2,4 DTB

WORDS 58-59	INTRASLOT TIME	REAL

RANGE: ±3906.25 (±0.5 slots)
UNITS: Microseconds
DEFINITION: Sub-slot remainder of time

2,4 DTB

10.1.1.3.1.4.4 Universal Transverse Mercator (UTM)/Universal Polar Stereographic (UPS) Data. The format of words 61-65 shall be as defined in JINTACCS JTIDS TIDP for the PPLI UTM/UPS Position Continuation Codeword.

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	0	1	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	1	X	X	X
. . .	. . .															
wd 60	TIME TAG															
wd 61	15															0
wd 62	31															16
wd 63	47															32
wd 64	63															48
wd 65											69					64

2,8 DTB

10.1.1.3.1.4.5 Start-Up NAV Data. The Start-Up NAV Data DTB shall be formatted as shown below. Items that do not apply to a particular system shall be set to zero.

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0
wd 1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
wd 2	TIME TAG															
wd 3	NAV SYSTEM INDEX					AR		PD	VR		NMECH			STYPE		
wd 4-5	ALTITUDE SCALE FACTOR IC [1,2] OR Z VELOCITY IC [3]															
wd 6-7	VELOCITY IC [3]															
wd 8-9	AZIMUTH IC [1,2]															
wd 10-11	MISALIGNMENT IC [1] OR AZIMUTH DRIFT IC [2]															
wd 12-13	VELOCITY DAMPING IC [1] OR VELOCITY SCALE FACTOR IC [2]															
wd 14-15	POSITION PN [1,2,3]															
wd 16-17	ALTITUDE SCALE FACTOR PN [1,2] OR Z VELOCITY PN [3]															
wd 18-19	VELOCITY PN [1, 2, 3]															
wd 20-21	AZIMUTH PN [1, 2]															
wd 22-23	MISALIGNMENT PN [1] OR AZIMUTH DRIFT PN [2]															
wd 24-25	VELOCITY DAMPING PN [1] OR VELOCITY SCALE FACTOR PN [2]															
wd 26-27	ALTITUDE BIAS PN [1, 2, 3]															
wd 28-29	NOT USED															
wd 30	ALTITUDE SF CORRELATION DISTANCE [1, 2] OR Z VELOCITY TIME CONSTANT [3]															
wd 31	HORIZONTAL VELOCITY TIME CONSTANT [2, 3]															
wd 32	AZIMUTH TIME CONSTANT [2]															
wd 33	NOT USED															
wd 34-35	DAMPING MODE 1 GAINS [1]															
wd 36-37	DAMPING MODE 2 GAINS [1]															
wd 38	FREE INERTIAL (DAMPING) GAIN [1]															
wd 39	NOT USED															

NOTE 1: THIS ITEM APPLIES TO INERTIAL NAVIGATION SYSTEMS (STYPE=0).
NOTE 2: THIS ITEM APPLIES TO NON-INERTIAL NAVIGATION SYSTEMS (STYPE=1).
NOTE 3: THIS ITEM APPLIES TO TOA-ONLY NAVIGATION SYSTEMS (STYPE=2).

NOTE: DATA VALUES FOR EACH NAVIGATION SYSTEM SHALL BE AS SPECIFIED IN PARAGRAPH 10.7 OF Y240M798E0100 (NAVY AIR) AND Y240M822E0100 (NAVY SHIP).

WORD 2 TIME TAG 16-BIT SIGNED INTEGER

RANGE: -32768 to +32767
LSB: 7.8125 x 10**-3 (one slot)
UNITS: Seconds
DEFINITION: Time tag of slot during which data is valid.

WORD 3 NAVIGATION SYSTEM DEFINITION

BIT	DESIGNATION
0-2	SYSTEM TYPE (STYPE)

CODING	DEFINITION
0	INERTIAL
1	NON-INERTIAL
2	TOA-ONLY (NO D/R)
4	GPS-AIDED
5-7	NOT USED

3-5 NAVIGATION MECHANIZATION (NMECH)
(FOR INERTIAL AND NON-INERTIAL SYSTEMS)

CODING	INERTIAL	NON-INERTIAL
0	NORTH SLAVED	MAGNETIC SLAVED
1	WANDER AZIMUTH	NOT USED
2	UNIPOLAR	NOT USED
3	FREE AZIMUTH	FREE DRIFT
4-7	NOT USED	NOT USED

6-7 VELOCITY REFERENCE TYPE (VR)
(FOR DOPPLER/AHRS SYSTEMS)

CODING	DEFINITION
0	REFERENCE TO EARTH-FIXED MEDIUM
1	REFERENCE TO MOVING MEDIUM
2-3	NOT USED

8 PLATFORM DEFINITION (PD)
(FOR TOA-ONLY SYSTEMS)

CODING	DEFINITION
0	MOBILE (SPEED MAY BE NON-ZERO)
1	FIXED POINT (SPEED MUST BE ZERO)

2,16 DTB

WORD 3 NAVIGATION SYSTEM DEFINITION (CONTINUED)

BIT	DESIGNATION
9-10	ALTITUDE REFERENCE TYPE (AR)

CODING	DEFINITION
0	INERTIAL ALTITUDE
1	BARO-ALTIMETER
2	SHIP
3	GROUND

11	NOT USED
12-15	NAV SYSTEM INDEX DEFINITION: For SICP use only, an index into the tuning parameter table. CODING: 0-15

2,16 DTB

WORDS 4-5 ALTITUDE SCALE FACTOR INITIAL COVARIANCE OR Z VELOCITY INITIAL COVARIANCE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF ALTITUDE SCALE-FACTOR ERROR (UNITLESS) (FOR INERTIAL AND NON-INERTIAL SYSTEMS) ONE-SIGMA ESTIMATE OF Z-VELOCITY ERROR. UNITS ARE FEET-SQUARED PER SECOND-SQUARED (FOR TOA-ONLY SYSTEMS)

WORDS 6-7 VELOCITY INITIAL COVARIANCE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF GEODETIC VELOCITY ERROR. UNITS ARE FEET-SQUARED PER SECOND-SQUARED

WORDS 8-9 AZIMUTH INITIAL COVARIANCE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF TOTAL AZIMUTH ERROR IN UNITS OF RADIANS-SQUARED.
INERTIAL	Z
NON-INERTIAL	AZ

WORDS 10-11 MISALIGNMENT OR AZIMUTH DRIFT INITIAL COVARIANCE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF TOTAL X, Y PLATFORM MISALIGNMENTS. UNITS ARE RADIANS-SQUARED (FOR INERTIAL SYSTEMS).
	ONE-SIGMA ESTIMATE OF AZIMUTH DRIFT ERROR. UNITS ARE RADIANS-SQUARED PER SECOND-SQUARED (FOR NON-INERTIAL SYSTEMS).

2,16 DTB

WORDS 12-13 VELOCITY DAMPING OR VELOCITY SCALE FACTOR INITIAL COVARIANCE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF DAMPING VELOCITY ERROR. UNITS ARE FEET- SQUARED PER SECOND-SQUARED (FOR INERTIAL SYSTEMS).
	ONE-SIGMA ESTIMATE OF VELOCITY SCALE-FACTOR ERROR. UNITLESS (FOR NON-INERTIAL SYSTEMS).

WORDS 14-15 POSITION PROCESS NOISE

CODING	DEFINITION
REAL	SPECTRAL DENSITY OF UNMODELLED GEODETIC POSITION UNCERTAINTY IN UNITS NORMALIZED WITH RESPECT TO THE REL NAV QUATERNIONS. UNITS ARE ONE-PER-SECOND.

WORDS 16-17 ALTITUDE SCALE FACTOR PROCESS NOISE OR Z VELOCITY PROCESS NOISE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF UNMODELLED ALTITUDE SCALE-FACTOR UNCERTAINTY. UNITLESS (FOR INERTIAL SYSTEMS).
	SPECTRAL DENSITY OF UNMODELLED ALTITUDE SCALE-FACTOR UNCERTAINTY. UNITS ARE ONE-PER-SECOND (FOR NON-INERTIAL SYSTEMS).
	SPECTRAL DENSITY OF UNMODELLED Z VELOCITY UNCERTAINTY. UNITS ARE FEET-SQUARED PER SECOND SQUARED PER SECOND (FOR TOA-ONLY SYSTEMS).

WORDS 18-19 VELOCITY PROCESS NOISE

CODING	DEFINITION
REAL	SPECTRAL DENSITY OF UNMODELLED GEODETIC VELOCITY UNCERTAINTY. UNITS ARE FEET-SQUARED PER SECOND-SQUARED PER SECOND (FOR INERTIAL SYSTEMS).
	ONE-SIGMA ESTIMATE OF UNMODELLED GEODETIC VELOCITY UNCERTAINTY. UNITS ARE FEET-SQUARED PER SECOND SQUARED (FOR NON-INERTIAL AND TOA-ONLY SYSTEMS).

2,16 DTB

WORDS 20-21 AZIMUTH PROCESS NOISE

CODING	DEFINITION
REAL	SPECTRAL DENSITY OF UNMODELLED AZIMUTH UNCERTAINTY. UNITS ARE RADIANS-SQUARED PER SECOND (FOR INERTIAL SYSTEMS).
	ONE-SIGMA ESTIMATE OF UNMODELLED AZIMUTH UNCERTAINTY. UNITS ARE RADIANS-SQUARED (FOR NON-INERTIAL SYSTEMS).

WORDS 22-23 MISALIGNMENT OR AZIMUTH DRIFT PROCESS NOISE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF UNMODELLED X, Y, PLATFORM MISALIGNMENTS. UNITS ARE RADIANS-SQUARED PER SECOND (FOR INERTIAL SYSTEMS).
	ONE-SIGMA ESTIMATE OF UNMODELLED AZIMUTH DRIFT UNCERTAINTY. UNITS ARE RADIANS-SQUARED PER SECOND-SQUARED PER SECOND (FOR NON-INERTIAL SYSTEMS).

WORDS 24-25 VELOCITY DAMPING OR VELOCITY SCALE FACTOR PROCESS NOISE

CODING	DEFINITION
REAL	SPECTRAL DENSITY OF UNMODELLED VELOCITY DAMPING ERROR. UNITS ARE FEET-SQUARED PER SECOND-SQUARED PER SECOND (FOR INERTIAL SYSTEMS).
	ONE-SIGMA ESTIMATE OF UNMODELLED VELOCITY SCALE FACTOR UNCERTAINTY. UNITS ARE ONE PER SECOND (FOR NON-INERTIAL SYSTEMS).

WORDS 26-27 ALTITUDE BIAS PROCESS NOISE

CODING	DEFINITION
REAL	ONE-SIGMA ESTIMATE OF UNMODELLED ALTITUDE BIAS UNCERTAINTY. UNITS ARE FEET-SQUARED PER SECOND.

2,16 DTB

WORDS 28-29 NOT USED

WORD 30 ALTITUDE SCALE FACTOR CORRELATION DISTANCE OR Z VELOCITY TIME CONSTANT

CODING	DEFINITION
INTEGER IN RANGE 0 THRU 1048560	ALTITUDE SCALE FACTOR CORRELATION DISTANCE. UNITS ARE FEET (FOR INERTIAL AND NON-INERTIAL SYSTEMS).
LSB=16	MARKOFF TIME CONSTANT FOR VERTICAL VELOCITY STATE. UNITS ARE SECONDS (FOR TOA-ONLY SYSTEMS).

WORD 31 HORIZONTAL VELOCITY TIME CONSTANT

CODING	DEFINITION
INTEGER IN RANGE 0 THRU 1048560	MARKOFF TIME CONSTANT FOR HORIZONTAL VELOCITY STATES. UNITS ARE SECONDS (FOR NON-INERTIAL AND TOA-ONLY SYSTEMS).
LSB=16	

WORD 32 AZIMUTH TIME CONSTANT

CODING	DEFINITION
INTEGER IN RANGE 0 THRU 1048560	MARKOFF TIME CONSTANT FOR NON-INERTIAL AZIMUTH STATES. UNITS ARE SECONDS (FOR NON-INERTIAL SYSTEMS).
LSB=16	

WORD 33 NOT USED

2,16 DTB

WORD 34 DAMPING MODE 1 GAIN K_D

DESCRIPTION: 15 BITS IN SCALED BINARY: BIT 15 IS ZERO
MSB (BIT 14): 2**-4
LSB: 2**-18
UNITS: ONE PER SECOND
RANGE: 0 to (0.125-LSB)

WORD 35 DAMPING MODE 1 GAIN K_V

DESCRIPTION AND FORMAT ARE SAME AS WORD 34

WORD 36 DAMPING MODE 2 GAIN K_D

DESCRIPTION AND FORMAT ARE SAME AS WORD 34.

WORD 37 DAMPING MODE 2 GAIN K_V

DESCRIPTION AND FORMAT ARE SAME AS WORD 34.

WORD 38 FREE INERTIAL (DAMPING) GAIN K_U

DESCRIPTION AND FORMAT ARE SAME AS WORD 34.

WORD 39 NOT USED

10.1.1.3.1.5 NAV Data from NICP.

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	0	1	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wd 2	TIME TAG															
wd 3-4	GEODETIC LATITUDE															
wd 5-6	GEODETIC LONGITUDE															
wd 7-8	GEODETIC ALTITUDE															
wd 9-10	GEODETIC X SPEED															
wd 11-12	GEODETIC Y SPEED															
wd 13-14	PLATFORM AZIMUTH MISALIGNMENT CORRECTION OR GEODETIC Z ACCELERATION															
wd 15-16	EAST-WEST RADIUS OF CURVATURE															
wd 17-18	P_u															
wd 19-20	P_v															
wd 21-22	P_w															
wd 23-24	U SPEED															
wd 25-26	V SPEED															
wd 27-28	W SPEED															
wd 29-30	NOT USED															
wd 31-32	ESTIMATED GRID-ORIGIN LATITUDE															
wd 33-34	ESTIMATED GRID-ORIGIN LONGITUDE															
wd 35-36	ESTIMATED RELATIVE-GRID AZIMUTH															
wd 37-38	RESERVED FOR COMMON GRID-ORIGIN LATITUDE															
wd 39-40	RESERVED FOR COMMON GRID-ORIGIN LONGITUDE															
wd 41	Q_H | RESERVED FOR COMMON GRID ID															
wd 42-43	NORTH SPEED OF MEDIUM OR GEODETIC Z VELOCITY															
wd 44-45	WEST SPEED OF MEDIUM															
wd 46-47	X-AXIS MISALIGNMENT CORRECTION OR GEODETIC X ACCELERATION															
wd 48-49	Y-AXIS MISALIGNMENT CORRECTION OR GEODETIC Y ACCELERATION															
wd 50-51	WANDER ANGLE															
wd 52-53	RELATIVE GRID REFERENCE ANGLE															
wd 54	REL NAV KALMAN FILTER STATUS WORD 1															
wd 55	TRANSMITTED QUALITY STATUS WORD															

3,0 DTB

WORD 2 TIME TAG 16-BIT SIGNED INTEGER

RANGE: -32768 to +32767
LSB: 7.8125 x 10**-3 (one slot)
UNITS: Seconds
DEFINITION: Time tag of slot during which data is valid. This will be the same as the time tag in the D/R block (ADR1=2, ADR2=1) upon which this block depends.

WORDS 3-4 GEODETIC LATITUDE (λ) BAM

DEFINITION: Present geodetic latitude (WGS-84)

WORDS 5-6 GEODETIC LONGITUDE ($\emptyset$) BAM

DEFINITION: Present geodetic longitude (WGS-84)

WORDS 7-8: GEODETIC ALTITUDE (h) REAL

UNITS: Feet
DEFINITION: Present altitude referenced to Mean Sea Level (MSL)

WORDS 9-10 GEODETIC X SPEED (V_X) REAL

UNITS: Feet per second
DEFINITION: Speed in estimated X direction earth-referenced coordinates.

X and Y are local vertical nominally north and west, respectively, when wander angle is 0.0 degrees.

WORDS 11-12 GEODETIC Y SPEED (V_Y) REAL

UNITS: Feet per second
DEFINITION: Speed in estimated Y direction earth-referenced coordinates.

X and Y are local vertical nominally north and west, respectively, when wander angle is 0.0 degrees.

WORDS 13-14 PLATFORM AZIMUTH MISALIGNMENT CORRECTION (Θ_Z) BAM

DEFINITION: The angular difference between the platform X-axis and the Terminal's estimate of reference X-axis. The sense is positive clockwise from reference X-axis to platform X-axis.

OR

3,0 DTB

GEODETIC Z ACCELERATION (A_Z) REAL

UNITS: Feet per second per second
DEFINITION: Acceleration in estimated Z direction earth-referenced coordinates (3 state TOA-only mobile mode of navigation)

WORDS 15-16 EAST-WEST RADIUS OF CURVATURE (r_{ew}) REAL

UNITS: Feet
DEFINITION: Length of line segment, normal to the WGS-84 spheroid, from present position to spheroid axis of rotation.

3,0 DTB

WORDS 17-18 P_u REAL

UNITS: Feet
DEFINITION: U component of relative position in grid defined by estimated grid origin and estimated relative grid azimuth.

WORDS 19-20 P_v REAL

UNITS: Feet
DEFINITION: V component of relative position in grid defined by estimated grid origin and estimated relative grid azimuth.

WORDS 21-22 P_w REAL

UNITS: Feet
DEFINITION: W component of relative position in grid defined by estimated grid origin and estimated relative grid azimuth.

WORDS 23-24 U SPEED (V_u) REAL

UNITS: Feet per second
DEFINITION: Relative speed in U direction

WORDS 25-26 V SPEED (V_v) REAL

UNITS: Feet per second
DEFINITION: Relative speed in V direction

WORDS 27-28 W SPEED (V_w) REAL

UNITS: Feet per second
DEFINITION: Relative speed in W direction

WORDS 29-30 NOT USED

WORDS 31-32 ESTIMATED GRID-ORIGIN LATITUDE (λ_{oe}) BAM

DEFINITION: Grid-origin latitude to be used to convert relative positions in the grid to best estimate of geodetic position.

WORDS 33-34 ESTIMATED GRID-ORIGIN LONGITUDE ($\emptyset_{oe}$) BAM

DEFINITION: Grid-origin longitude to be used to convert relative positions in the grid to best estimate of geodetic position.

3,0 DTB

WORDS 35-36 ESTIMATED RELATIVE GRID AZIMUTH (ß) BAM

DEFINITION: The angular difference between the north axis and the relative grid V axis at the estimated grid origin. The sense is positive counterclockwise from north axis to grid V axis.

WORDS 37-40 RESERVED FOR COMMON GRID ORIGIN LATITUDE, COMMON GRID ORIGIN LONGITUDE.

WORD 41 Q_H OR RESERVED FOR COMMON GRID ID

BIT	DESIGNATION
0-11	RESERVED FOR COMMON GRID ID
12-15	TRANSMITTED ALTITUDE QUALITY (Q_H)

WORDS 42-43 NORTH SPEED OF MEDIUM (V_{wn}) REAL

FOR NAVY SHIP ONLY, X-DAMPING STATE (Vßx)
UNITS: Feet per second.

DEFINITION: For NAVY SHIP ONLY, Estimated X-velocity Damping Error (inertial systems only) or estimated water motion speed in North direction (non-inertial systems only).
For NAVY AIR ONLY, Estimated airmass speed in North direction (non-inertial systems only).

OR

GEODETIC Z VELOCITY (V_Z) REAL

UNITS: Feet per second

DEFINITION: Velocity in estimated Z direction earth-referenced coordinates (3 state TOA-only mobile mode of navigation).

WORDS 44-45 WEST SPEED OF MEDIUM (V_{ww}) REAL

FOR NAVY SHIP ONLY, Y-DAMPING STATE (Vßy)

UNITS: Feet per second.

DEFINITION: For NAVY SHIP ONLY, Estimated Y-velocity Damping Error (inertial systems only) or estimated water motion speed in West direction (non-inertial systems only).
For NAVY AIR ONLY, Estimated airmass speed in West direction (non-inertial systems only).

3,0 DTB

WORDS 46-47 MISALIGNMENT CORRECTION (Θ_X) BAM

DEFINITION: Platform misalignment about the X-axis with respect to the terminals estimated local level frame. The sense of the rotation is positive counterclockwise from the terminal's local level frame to the platform frame (inertial systems only).

OR

GEODETIC X ACCELERATION (A_X) REAL

UNITS: Feet per second per second

DEFINITION: Acceleration in estimated X direction earth-referenced coordinates (3 state TOA-only mobile mode of navigation).

WORDS 48-49 MISALIGNMENT CORRECTION (Θ_Y) BAM

DEFINITION: Platform misalignment about the Y-axis with respect to the terminals estimated local level frame. The sense of the rotation is positive counterclockwise from the terminal's local level frame to the platform frame (inertial systems only).

OR

GEODETIC Y ACCELERATION (A_Y) REAL

UNITS: Feet per second per second

DEFINITION: Acceleration in estimated Y direction earth-referenced coordinates (3 state TOA-only mobile mode of navigation).

WORDS 50-51 WANDER ANGLE (α) BAM

DEFINITION: The angular difference between the north axis estimate and reference X-axis estimate. The sense is positive counterclockwise from north axis to X axis.

WORDS 52-53 RELATIVE GRID REFERENCE ANGLE (α_g) BAM

DEFINITION: The angular difference between the north axis at the estimated grid origin and the north axis at the reference grid origin. The sense is positive counterclockwise from north axis at estimated grid origin to reference north axis.

3,0 DTB

WORD 54 REL NAV KALMAN FILTER STATUS WORD 1

BIT	DESIGNATION
0-3	RNKF status 0 INITIALIZATION/ NO FILTER OPERATION 1 NAVIGATION RESET 2 CLOCK BIAS INITIALIZATION 3 GRID ACQUISITION 4 NOT USED 5 GEODETIC OBSERVATION PROCESSING 6 GEODETIC AND GRID OBSERVATION PROCESSING 7-15 NOT USED
4	LOGIC 1 = KALMAN FILTER ALTERATION ACTION (KFA)
5	LOGIC 1 = KALMAN FILTER RESET (KFR)
6-8	SYSTEM TYPE (STYPE) 0 INERTIAL 1 NON-INERTIAL 2 TOA ONLY (NO D/R) 3-7 NOT USED
9	PLATFORM DEFINITION (PD) LOGIC 0 = MOBILE LOGIC 1 = FIXED POINT
10	NOT USED
11	COMMUNITY NAVIGATION CONTROLLER (CNC) LOGIC 1 = GROUND POINT LOGIC 0 = MOBILE
12	NOT USED
13	LOGIC 1 = NON-NAV SYNC OBSERVATION SCREENED (SOS)
14	LOGIC 1 = GEO-FIX OBSERVATION SCREENED (FOS)
15	LOGIC 1 = PPLI OBSERVATION SCREENED (POS)

3,0 DTB

WORD 55 TRANSMITTED QUALITY STATUS WORD

BIT	DESIGNATION
0-3	TIME QUALITY (Q_T) SEE TABLE VI-V
4-7	GEODETIC POSITION QUALITY (Q_{PG}) SEE TABLE VI-V
8-11	RELATIVE POSITION QUALITY (Q_{PR}) SEE TABLE VI-V
12-14	RELATIVE AZIMUTH QUALITY (Q_{AR}) SEE TABLE VI-V
15	NOT USED

3,0 DTB

10.1.1.3.1.6 Initialization Data.

10.1.1.3.1.6.1 Bi-directional Initialization Data. The Bi-directional Initialization Data DTB shall be as follows:

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	1	0	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wd 2	TIME TAG															
wd 3	SPARE															
wd 4	BLOCK NO. (0-63)						FIRST VALID WORD NO. (2-31)				DATA WORD COUNT (DWC) (1-30)					
wd 5	INITIALIZATION WORD															
. . .	. . .															
2+ FIRST VALID WORD NO.+ DWC	INITIALIZATION WORD															

The bit designation shall be as follows:

WORD 3

BIT	DESIGNATION
0-15	SPARE

WORD 4

BIT	DESIGNATION
0-4	DATA WORD COUNT (1-30) INDICATES THE NUMBER OF CONTIGUOUS VALID DATA WORDS BEING TRANSFERRED.
5-9	WORD NUMBER FOR FIRST OF DWC CONTIGUOUS VALID WORDS. RANGE FOR WORDS SHALL BE 2 THRU 31.
10-15	BLOCK NUMBER (0-63) INDICATES THE BLOCK CONTAINING THE INITIALIZATION DATA WORDS.

WORDS 5 TO (2+FIRST VALID WD. NO.+DWC)

INITIALIZATION DATA WORDS. WORDS PRECEDING THE FIRST VALID WORD SHALL BE "DON'T CARE" DATA.

4,0 DTB

10.1.1.3.1.6.2 NICP Initialization Data Status Response. The NICP Initialization Data Status Response DTB shall be as follows:

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	1	0	0	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
wd 2	TIME TAG															
wd 3	DR															
wd 4	BLOCK NO. (0-63)								FIRST VALID WORD NO. (2-31)							DATA WORD COUNT (DWC)
wd 5	RESPONSE WORD															
. . .	. . .															
2+ FIRST VALID WORD NO.+ DWC	RESPONSE WORD															

The bit designation shall be as follows:

WORD 3

BIT	DESIGNATION
0-14	NOT USED
15	DATA REJECTED (DR) LOGIC 1 = INDICATES AT LEAST ONE INITIALIZATION DATA WORD HAS BEEN REJECTED IN THE RESPONSE WORDS THAT FOLLOW. LOGIC 0 = INDICATES ALL INITIALIZATION WORDS WERE ACCEPTED.

WORD 4

BIT	DESIGNATION	
0-4	DATA WORD COUNT	THESE FIELDS REMAIN UNCHANGED AS SET BY THE SICP VIA THE INITIALIZATION DATA DTB.
5-9	FIRST VALID WORD NUMBER	
10-15	BLOCK NUMBER (0-63)	

4,1 DTB

WORDS 5 to (2+ FIRST VALID WORD NO. +DWC)

INITIALIZATION RESPONSE WORDS FOR EACH BIT OF EACH DATA FIELD
LOGIC 1 = DATA REJECTED
LOGIC 0 = DATA ACCEPTED OR DON'T CARE DATA

4,1 DTB

10.1.1.3.1.7 Status Data.

10.1.1.3.1.7.1 NPG Mapping Status. The NPG Mapping Status DTB shall be as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	1	0	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wd 2	TIME TAG															
wd 3	A/I		EXTN NPG NUMBER									NUMBER ASSIGNS				
wd 4	A/I		EXTN NPG NUMBER									NUMBER ASSIGNS				
. . .	. . .															
wd 34	A/I		EXTN NPG NUMBER									NUMBER ASSIGNS				

The bit designation shall be as follows:

WORDS (3-34)

BIT	DESIGNATION
0-4	NUMBER OF TRANSMIT ASSIGNMENTS IN SLOT ASSIGNMENT TABLE CORRESPONDING TO GIVEN NPG.
5-13	(EXTERNAL) NPG NUMBER (1 to 511)
14	NOT USED
15	ACTIVE/INACTIVE ENTRY INDICATION (A/I) LOGIC 1 = SET TO ACTIVE

Notes:

1. The 5(Five)-bit internal NPG corresponding to an external NPG is determined as follows:
   If the external NPG appears in word x (where x ranges from 3 to 32) of Status Block 10, the internal NPG corresponding to it equals x-3.
   If the internal NPG appears on word x of Status Block 11, the internal NPG corresponding to it equals x+27.
2. The terminal reserves words 3, 33, and 34 (Internal NPGs 0, 30, and 31) to report the status of external NPGs 1, 30, 31, respectively. There are no such restrictions on words 4-32.

For transmit NPGs only

5,0 DTB

10.1.1.3.1.7.2 Real Time Slot Assignment Sequence. The Real Time Slot Assignment Sequence DTB shall be as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	1	0	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
wd 2	TIME TAG															
wd 3	CM	R/T			SAE NO.				NPG (INT)							
wd 4	CM	R/T			SAE NO.				NPG (INT)							
. . .	. . .															
wd 34	CM	R/T			SAE NO.				NPG (INT)							

5,1 DTB

WORDS 3-34

BIT	DESIGNATION
0-4	5 BIT (INTERNAL) NPG NUMBER OR DIRECTED RELAY GROUP NUMBER (DRG) OF THE TRANSMIT SLOT ASSIGNMENT. NOTE: NAVY DOES NOT USE DIRECTED RELAY GROUP.
5-10	SAE NO. - THE SLOT ASSIGNMENT ENTRY NUMBER (RANGE:0-63) OF THE TIME SLOT BLOCK USED
11-14	R/T SLOT CHARACTERIZATION

BIT 14	13	12	11	
0	0	0	0	DEFAULT RECEIVE, SAE NO. INVALID
0	0	0	1	RECEIVE ONLY (R)
0	0	1	0	TRANSMIT (T)
0	0	1	1	TRANSMIT OVER RECEIVE (TOR)
0	1	0	0	TRANSMIT OVER RELAY RECEIVE (TRR)
0	1	0	1	RELAY RECEIVE (RR)
0	1	1	0	RELAY TRANSMIT (RT)
0	1	1	1	RELAY TRANSMIT OVER RELAY RECEIVE (RTRR)
1	0	0	1	INITIAL ENTRY RECEIVE
1	0	1	0	INITIAL ENTRY TRANSMIT
1	1	0	1	UNASSIGNED RECEIVE
1	1	1	0	UNASSIGNED TRANSMIT

NOTE: ALL OTHER VALUES DO NOT APPLY

15 CRYPTOGRAPHIC MODE (CM)
LOGIC 1 = INDICATES PARTITIONED VARIABLE MODE ASSIGNMENT.
LOGIC 0 = INDICATES COMMON VARIABLE MODE

NOTE: In the case of TOR, TRR or RTRR the NPG and SAE number will correspond to the transmit assignment, and if no message is available for transmission (in receive slot) the slot characteristic should default to the receive.

Words 3 through 34 apply to time slots 32 through 63, respectively,after the Time Tag.

5,1 DTB

10.1.1.3.1.7.3 Message Status. The NICP Message Status DTB (including R/C replies) shall be as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	1	0	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
wd 2	TIME TAG															
wd 3	MSV							MSTAT				NPG (INT)				
wd 4	MESSAGE ID (LOOPBACK) TAG															
. . .	. . .															
N	R/C STATUS			CT								R/C CODE				
N+1	ORIGINAL MESSAGE (LOOPBACK) TAG/STN															
N+2 N+3	CHECKSUM															
N+4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N+5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Words 3 and 4 are repeated for all messages with status changes (repeatable a maximum of 48 times). Words N through N+3 are collectively known as R/C Reply Data. A maximum of 2 R/C Reply sub blocks may accompany the maximum of 48 message status change reports.

The bit designation shall be as follows:

WORD 3

BIT	DESIGNATION
0-4	INTERNAL NPG OF MESSAGE

5,2 DTB

BIT	DESIGNATION
5-8	MESSAGE STATUS CHANGE (MSTAT)

BIT 8	7	6	5	
0	0	0	0	NOT USED
0	0	0	1	REJECTED - TRANSMIT BUFFER FULL
0	0	1	0	REJECTED (FROM TOL) SPECIFIED TRANSMIT TIME HAS EXPIRED
0	0	1	1	REJECTED (FROM NPG) INVALID NPG
0	1	0	0	NOT USED
0	1	0	1	DELETED (FROM TOL) TIME SHIFT
0	1	1	0	NOT USED
0	1	1	1	DELETED FROM TRANSMIT QUEUE STALENESS EXCEEDED
1	0	0	0	REJECTED - REPROM REQUEST EXCEEDS PACK/LENGTH LIMITS
1	0	0	1	REJECTED - NO BUFFERS AVAILABLE, ALL FULL
1	0	1	0	REJECTED - IPF DUTY FACTOR EXCEEDED
1	0	1	1	NOT USED
.	.	.	.	
1	1	1	1	NOT USED

9-14	NOT USED
15	MESSAGE STATUS VALIDITY (MSV) LOGIC 0 = DATA VALID IN THIS AND NEXT WORD LOGIC 1 = DATA NOT VALID - NEXT WORD BEGINS R/C SUB-BLOCK

WORD 4

BIT	DESIGNATION
0-15	SEE DESCRIPTION FOR MESSAGE ID TAG (0,0 DTB) IN WORD 3 OF TADIL J MESSAGE TO TRANSMIT DTB.

WORD N

BIT	DESIGNATION
0-4	RECEIVED R/C CODE, VALID IF R/C STATUS = "001" or "010"
5-11	NOT USED
12	CATALOG TYPE (CT) LOGIC 1 = IJMS SLOT LOGIC 0 = TADIL J SLOT

5,2 DTB

BIT	DESIGNATION
13-15	R/C STATUS R/C = 000, NO R/C REPLY, 001, CURRENT WORD AND NEXT FOLLOWING WORD CONTAIN RECEIVED R/C REPLY (TO AN SICP ORIGINAL R/C MESSAGE). 010, NICP RECEIVED R/C CODE = 31, CURRENT WORD AND THREE FOLLOWING WORDS VALID, AND TAG WORD CONTAINS STN OF RECEIVED MESSAGE. 011, EXPECTED REPLY TO SICP ORIGINAL R/C MESSAGE WAS NOT RECEIVED (3 FAILURES). NEXT WORD IS ID TAG OF ORIGINAL R/C MESSAGE. 100, SICP ORIGINAL R/C MESSAGE WAS NOT TRANSMITTED. REASON IS EITHER NO VALID SLOT ASSIGNMENT TO SUPPORT TRANSMISSION, OR R/C INTERROGATION TABLE IS FULL, (LIMIT = 3). NEXT WORD IS ID TAG OF R/C MESSAGE. 101-111, NOT USED

WORD N+1

BIT	DESIGNATION
0-15	Message tag original (SICP) R/C message, valid only if R/C STATUS = 001, 011 or 100, or STN of received R/C message, valid if R/C STATUS = 010.

WORDS N+2 and N+3

Thirty two (32) bit integer checksum of received message with R/C CODE= 31, valid only if R/C STATUS = 010.

WORDS N+4 and N+5

BIT	DESIGNATION
0-15	Set to all zeroes.

5,2 DTB

10.1.1.3.1.7.4 NICP 12-Second Status Report. The NICP 12-second Status Report DTB shall be as follows:

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	1	0	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
wd 2	TIME TAG															
wd 3	NO. OF TRANSMISSIONS RECEIVED DURING LAST REPORTING INTERVAL															
wd 4	NO. OF RTT INTERROGATIONS TRANSMITTED															
wd 5	NO. OF RTT REPLIES RECEIVED															
wd 6	NO. TRANSMISSIONS RECEIVED IN ERROR															
wd 7	NO. MESSAGES NOT ACKNOWLEDGED															
wd 8	NO. LOOPBACK DECODE FAILS															
wd 9	NO. LOOPBACK TOA FAILS															
wd 10	NO. LOOPBACK FAILS (NO LOOPBACK)															
wd 11	NO. OF SUCCESSFUL LOOPBACKS															
wd 12	NO. TEST MESSAGE BIT-BY-BIT COMPARE FAILS															
wd 13	NO. OF SUCCESSFULLY RECEIVED TEST MESSAGES															
wd 14		IPF FAILURES					IPF MODE		COMM MODE			TEST MODE		XMIT MODE		
wd 15	INTF		TFC	GMAF	GMF	PIR		CHF	SQN	DVZ	OVS	NOB	TO	ROMF	RAMF	CPUF
wd 16	INTERRUPT SLOT # WORD 1						CFU	DSW	SCHF	DFU	DNA	UDTB	SICPF	RTF	TMWF	FRT	PTPF
wd 17	RFAB	RFAA	IPFS	SRAM	CRYPTO STATUS									RELAY STATUS		
wd 18	OTS	Q_{AR}		Q_{PR}			Q_{PG}				Q_T					
wd 19	NTR	ETR	RTSUM	ETSUM	SOVF		SFR	PAS	AAP	ACT	FSA	FSP	CSC	CSA		
wd 20-21	SUMMED CLOCK BIAS															
wd 22					HARDWARE FREQUENCY CORRECTION											

5,3 DTB

NICP 12-second Status Report (continued)

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 23	TAC	NCS	HIPFF	XDFE	NFS	NO. OF IPF ALARMS									TOD SET	
wd 24		TOD SLOT NUMBER														
wd 25	INTERRUPT SLOT # WORD 2						TOD SEQN			TOD EPOCH NUMBER						
wd 26	NO. OF ILLEGAL INSTRUCTION INTERRUPTS															
wd 27	NO. OF ILLEGAL CPU CLOCK STATE INTERRUPTS															
wd 28			LBE	LBD	LBC	LBB	LBA	LB9	LB8	LB7	LB6	LB5	LB4	LB3	LB2	LB1
wd 29-30	CONSTANT FREQUENCY OFFSET STATE															
wd 31	POS	FOS	SOS		CNC		PD	STYPE			KFR	KFA	RNKF STATUS			
wd 32		Q_{AR}			Q_{PR}			Q_{PG}			Q_T					
wd 33	R/S C ID			R/S	Q_H				PR	NAV				S	GEF	GVF
wd 34	R/T BIT WORD 1															
wd 35	R/T BIT WORD 2															
wd 36	R/T BIT WORD 3															
wd 37	R/T BIT WORD 4															
wd 38	PTP BIT WORD 1															
wd 39	PTP BIT WORD 2															
wd 40	CTP BIT WORD 1															
wd 41	CTP BIT WORD 2															

5,3 DTB

WORD 2 Time Tag

System time of DTB creation, Corresponds to Time of Day in words 23 - 25.

WORDS 3-12 12 Second Message Status Report

WORD 3 Number of transmissions received during last reporting interval. (Does not include RTT's).

WORD 4 Number of RTT interrogations transmitted

WORD 5 Number of RTT replies received

WORD 6 Number of transmissions received in error

WORD 7 Number of messages not acknowledged

WORD 8 Number of loopback decode fails

WORD 9 Number of loopback TOA fails

WORD 10 Number of loopback fails (no loopback)

WORD 11 Number of successful loopbacks

WORD 12 Number of test message bit-by-bit compare fails

WORD 13 Number of successfully received test messages

WORD 14 Mode word

BIT	DESIGNATION

0-2 TRANSMISSION MODE (XMIT MODE)

BIT 2	1	0	
0	0	0	TDMA OFF
0	0	1	NORMAL
0	1	0	POLLING
0	1	1	NOT USED
1	0	0	DATA SILENT
1	0	1	NOT USED
1	1	0	NOT USED
1	1	1	LONG TERM TRANSMIT INHIBIT

3-4 TEST MODE

BIT 4	3	
0	0	TEST MODE OFF
0	1	TEST MODE 1
1	0	TEST MODE 2
1	1	NOT USED

5,3 DTB

BIT	DESIGNATION
5-7	COMMUNICATIONS MODE (COMM)

BIT 7	6	5	
0	0	0	NOT USED
0	0	1	A/J MODE 1
0	1	0	A/J MODE 2
0	1	1	NOT USED
1	0	0	A/J MODE 4
1	0	1	NOT USED
1	1	0	NOT USED
1	1	1	NOT USED

8-9 IPF OVERRIDE

BIT 9	8	
0	0	OFF, 100/20
0	1	EXERCISE
1	0	COMBAT
1	1	OFF, 100/50

IPF FAILURES (BITS 10-14)

10 LOGIC 1 = POWER LIMIT FAILURE

11 LOGIC 1 = FREQUENCY SPECTRUM FAILURE

12 LOGIC 1 = PULSE WIDTH FAILURE

13 LOGIC 1 = RADIATED ENERGY FAILURE

14 LOGIC 1 = UTILIZATION FAILURE

15 RESERVED FOR NAVY AIR SICP USE

WORD 15 BIT Word 1

BIT	DESIGNATION
0	LOGIC 1 = CPU FAIL (CPUF)
1	LOGIC 1 = RAM FAIL (RAMF)
2	LOGIC 1 = ROM FAIL (ROMF)
3	LOGIC 1 = TIME OVERLOAD (TO)
4	LOGIC 1 = NO BUFFERS AVAILABLE (NOB)
5	LOGIC 1 = FLOATING POINT OVERFLOW (OVS)

5,3 DTB

WORD 15 BIT Word 1 (continued)

BIT	DESIGNATION
6	LOGIC 1 = FLOATING DIVIDE BY ZERO (DVZ)
7	LOGIC 1 = SQUARE ROOT NEGATIVE ARGUMENT (SQN)
8	LOGIC 1 = CHRONOMETER FAIL (CHF)
9	LOGIC 1 = NOT USED
10	LOGIC 1 = POSITION INITIALIZATION REQUIRED (PIR)
11	LOGIC 1 = GLOBAL MEMORY FAIL (GMF)
12	LOGIC 1 = GLOBAL MEMORY ADDRESS FAIL (GMAF)
13	LOGIC 1 = ASSIGNMENT PENDING TABLE FULL (TFC)
14	LOGIC 1 = NOT USED
15	INTERRUPT FLAG (INTF) LOGIC 1 = HPA OR R/T POWER INTERRUPT HAS OCCURRED AND THE TUNING BUS HAS BEEN PULLED HIGH BY THE PTP LOGIC 0 = NO STATEMENT. INTERRUPT SLOT NUMBER, WORDS 1 AND 2 ARE INVALID. (BITS 11-15 OF WORD 16 AND BITS 10-15 OF WORD 25).

WORD 16 BIT Word 2

BIT	DESIGNATION
0	LOGIC 1 = PTP FAIL (PTPF)
1	LOGIC 1 = FREEZE TIME (FRT)
2	LOGIC 1 = TUNE MODE WRAPAROUND FAIL (TMWF)
3	LOGIC 1 = R/T FAIL (RTF)
4	LOGIC 1 = SICP FAIL (SICPF)
5	LOGIC 1 = UNIDENTIFIABLE DTB (UDTB)
6	LOGIC 1 = DTB NOT ACKNOWLEDGED (DNA)
7	LOGIC 1 = DTB FULL (DFU)
8	LOGIC 1 = TASK SCHEDULE FAIL (SCHF)
9	LOGIC 1 = INVALID DTB START WORD (DSW)

5,3 DTB

WORD 16 BIT Word 2 (continued)

BIT	DESIGNATION
10	LOGIC 1 = CTP FULL (CFU)
11-15	INTERRUPT SLOT NUMBER WORD 1 5 MSB's OF 11-BIT SLOT NUMBER TIME TAG BETWEEN NICP STATUS REPORTS, WHEN AN HPA OR R/T POWER INTERRUPT FORCES THE TUNING BUS TO BE PULLED HIGH BY THE PTP. REMAINING 6 LSB's FOUND IN WORD 25.

WORD 17 Crypto and relay status word

BIT	DESIGNATION
	RELAY STATUS (BITS 0-2)
0	LOGIC 1 = ACTIVE MAIN NET RELAY
1	LOGIC 1 = ACTIVE VOICE NET RELAY
2	LOGIC 1 = ACTIVE CONTROL NET RELAY
	CRYPTO STATUS (BITS 3-11)
3	LOGIC 1 = SDU VARIABLE 0 BAD
4	LOGIC 1 = SDU VARIABLE 1 BAD
5	LOGIC 1 = SDU VARIABLE 2 BAD
6	LOGIC 1 = SDU VARIABLE 3 BAD
7	LOGIC 1 = SDU VARIABLE 4 BAD
8	LOGIC 1 = SDU VARIABLE 5 BAD
9	LOGIC 1 = SDU VARIABLE 6 BAD
10	LOGIC 1 = SDU VARIABLE 7 BAD
11	LOGIC 1 = SDU ALARM
12	SHADOW RAM EXECUTION (SRAM) LOGIG 1 = NICP EXECUTION FROM SHADOW RAM
13	IPF SHUTDOWN (IPFS) LOGIC 1 = IPF SHUTDOWN (WD 23 BIT 13) MAPPED TO HPA STATUS LOGIC 0 = IPF SHUTDOWN (WD 23 BIT 13) MAPPED TO R/T STATUS
14	LOGIC 1 = FWD RFA (A) TEST FAIL
15	LOGIC 1 = AFT RFA (B) TEST FAIL

5,3 DTB

WORD 18 Transmitted qualities/OTAR Word

BIT	DESIGNATION
0-3	TIME QUALITY (Q_T) SEE TABLE VI-V
4-7	GEODETIC POSITION QUALITY (Q_{PG}) SEE TABLE VI-V
8-11	RELATIVE POSITION QUALITY (Q_{PR}) SEE TABLE VI-V
12-14	RELATIVE AZIMUTH QUALITY (Q_{AR}) SEE TABLE VI-V
15	LOGIC 1 = OTAR SUCCESSFUL (OTS)

5,3 DTB

WORD 19 Synchronization status word

BIT	DESIGNATION
0	LOGIC 1 = COARSE SYNC ACHIEVED (CSA)
1	LOGIC 1 = COARSE SYNC CONFIRMED (CSC)
2	LOGIC 1 = FINE SYNC IN PROGRESS (FSP)
3	LOGIC 1 = FINE SYNC ACHIEVED (FSA)
4	LOGIC 1 = ACTIVE SYNC MODE (ACT)
5	LOGIC 1 = ACTIVE AIDED PASSIVE SYNC, SECONDARY USER (AAP)
6	LOGIC 1 = PURE PASSIVE SYNC, DATA SILENCE (PAS)
7	LOGIC 1 = SYNC FILTER RESET (SFR)
8-9	NUMBER OF SYNC OBSERVATION VALIDITY FAILURES (SOVF)
10-11	ETR SUMMARY (ETSUM)

BIT 11	10	
0	0	NO STATEMENT
0	1	SUCCESSFUL ETR
1	0	ETR FAILURE
1	1	NOT USED

12-13 RTT SUMMARY

BIT 13	12	
0	0	NO STATEMENT
0	1	SUCCESSFUL RTT
1	0	RTT-A FAIL
1	1	RTT-B FAIL

14 ETR
LOGIC 1 = ETR IS ENABLED
LOGIC 0 = ETR IS NOT ENABLED

15 NTR
LOGIC 1 = TERMINAL IS NTR
LOGIC 0 = TERMINAL IS NOT NTR

WORDS 20-21 SUMMED CLOCK BIAS

TYPE: Real
UNITS: Nanoseconds
DEFINITION: Total amount of clock bias correction sent to clock over reporting period.

WORD 22 HARDWARE FREQUENCY CORRECTION

DEFINITION: Copy of Hardware frequency correction word sent to the RTB at reporting time.

The bit designation shall be as follows:

BIT	DESIGNATION
0-1	NOT USED
2-11	10 BITS OF FREQUENCY CORRECTION

(LSB = 20 x 2^{-9} HERTZ = 0.0390625 HERTZ)

IN THE FOLLOWING FORMAT

FREQUENCY	11 (BIT PATTERN) 2
F NOM +40 x 2^{-9} Hz	= 0 1 1 1 1 1 1 1 1 0
F NOM +20 x 2^{-9} Hz	= 0 1 1 1 1 1 1 1 1 1
F NOMINAL	= 1 0 0 0 0 0 0 0 0 0
F NOM -20 x 2^{-9} Hz	= 1 0 0 0 0 0 0 0 0 1
F NOM -40 x 2^{-9} Hz	= 1 0 0 0 0 0 0 0 1 0

WHERE F NOMINAL = 80 MHz

RANGE: APPROXIMATELY ±20 HERTZ

12-15	NOT USED

5,3 DTB

WORD 23 JTIDS time of day word 1

BIT	DESIGNATION
0-1	TOD SET

BIT 1	0	
0	0	NO STATEMENT
0	1	A
1	0	B
1	1	C

2-10	NUMBER OF IPF ALARMS
	TRANSMISSION SHUTDOWN INDICATORS (BITS 11-15)
11	LOGIC 1 = FINE SYNC NOT ACHIEVED (NFS)
12	LOGIC 1 = TRANSMIT DUTY FACTOR EXCEEDED (XDFE)

NOTE: Indicates the 50% or 20% transmit slot utilization limit has been reached. This bit will be set when the first transmission opportunity is missed because the message type chosen for that slot will cause the pulse limit in effect to be exceeded. Subsequent messages will be transmitted if their pulse count allows, until it is no longer possible to add another message of any type. While it is still possible for certain message types to be transmitted without exceeding the limit, the NICP/NIPG will accept new messages, and hold them in its buffers until the messages are dropped due to staleness or the buffer is full. When it is no longer possible for messages of any type to be transmitted without exceeding the limit, new messages to transmit will be rejected by the NICP/NIPG with an indication of IPF violation.

13	LOGIC 1 = HARDWARE IPF FAILURE (HIPFF)
14	LOGIC 1 = COARSE SYNC NOT ACHIEVED (NCS)
15	LOGIC 1 = TACAN ONLY (TAC)

WORD 24 JTIDS time of day word 2

BIT	DESIGNATION
0-14	TOD SLOT
	RANGE: 0 - 32767
15	NOT USED

5,3 DTB

WORD 25 JTIDS time of day word 3

BIT	DESIGNATION
0-6	TOD EPOCH RANGE: 0 - 112
7-9	TOD SEQUENCE RANGE: 0 - 7
10-15	INTERRUPT SLOT NUMBER WORD 2 6 LSBs OF 11 BIT SLOT NUMBER TIME TAG BETWEEN NICP STATUS REPORTS, WHEN AN HPA OR R/T POWER INTERRUPT FORCES THE TUNING BUS TO BE PULLED HIGH BY THE PTP. REMAINING 5 MSBs ARE FOUND IN WORD 16. LSB = 1 SLOT (RANGE = 0-1535 SLOTS INTO 12 SEC REPORTING INTERVAL).

WORD 26 Number of illegal instruction interrupts

WORD 27 Number of illegal CPU clock state interrupts

WORD 28 Loopback message type failure

BIT	DESIGNATION
0	LOGIC 1 = STANDARD FT UNCODED (LB1)
1	LOGIC 1 = PACKED 2 DP-FT UNCODED (LB2)
2	LOGIC 1 = PACKED 2 DP-FT CODED (LB3)
3	LOGIC 1 = PACKED 2 SP-FF CODED (LB4)
4	LOGIC 1 = STANDARD FF CODED (LB5)
5	LOGIC 1 = PACKED 2 DP-FF CODED (LB6)
6	LOGIC 1 = STANDARD FT CODED (LB7)
7	LOGIC 1 = PACKED 4 SP-FF CODED (LB8)
8	LOGIC 1 = PACKED 2 SP-FT UNCODED (LB9)
9	LOGIC 1 = PACKED 4 SP-FT UNCODED (LBA)
10	LOGIC 1 = PACKED 4 SP-FT CODED (LBB)
11	LOGIC 1 = PACKED 2 SP-FT CODED (LBC)
12	LOGIC 1 = TEST RTT LOOPBACK FAIL (LBD)
13	LOGIC 1 = RTT INT 2A (LBE)
14-15	NOT USED

WORD 29-30Constant frequency offset state

TYPE: Real
UNITS: Nanoseconds per second
DEFINITION: Kalman Filter constant frequency offset state.

5,3 DTB

WORD 31 Relative navigation Kalman Filter status Word 1

BIT	DESIGNATION
0-3	RNKF STATUS

BIT 3	2	1	0	
0	0	0	0	INITIALIZATION/NO FILTER OPERATION
0	0	0	1	NAVIGATION RESET
0	0	1	0	CLOCK BIAS INITIALIZATION
0	0	1	1	GRID ACQUISITION
0	1	0	0	NOT USED
0	1	0	1	GEODETIC OBSERVATION PROCESSING
0	1	1	0	GEODETIC AND GRID OBSERVATION PROCESSING
0	1	1	1	NOT USED
.	.	.	.	NOT USED
1	1	1	1	NOT USED

4	LOGIC 1 = KALMAN FILTER ALTERATION (KFA)
5	LOGIC 1 = KALMAN FILTER RESET (KFR)
6-8	SYSTEM TYPE (STYPE)

BIT 8	7	6	
0	0	0	INERTIAL
0	0	1	NON-INERTIAL
0	1	0	TOA ONLY (NO D/R)
0	1	1	NOT USED
.	.	.	NOT USED
1	1	1	NOT USED

9	PLATFORM DEFINITION (PD) LOGIC 0 = MOBILE LOGIC 1 = FIXED POINT
10	NOT USED
11	COMMUNITY NAVIGATION CONTROLLER (CNC) LOGIC 1 = GROUND POINT LOGIC 0 = MOBILE
12	NOT USED
13	LOGIC 1 = NON-NAV SYNC OBSERVATION SCREENED (SOS)
14	LOGIC 1 = GEO-FIX OBSERVATION SCREENED (FOS)
15	LOGIC 1 = PPLI OBSERVATION SCREENED (POS)

5,3 DTB

WORD 32 Kalman Filter qualities

BIT	DESIGNATION
0-3	TIME QUALITY (Q_T) SEE TABLE VI-IV
4-7	GEODETIC POSITION QUALITY (Q_{PG}) SEE TABLE VI-IV
8-11	RELATIVE POSITION QUALITY (Q_{PR}) SEE TABLE VI-IV
12-14	RELATIVE AZIMUTH QUALITY (Q_{AR}) SEE TABLE VI-IV
15	NOT USED.

5,3 DTB

WORD 33 Relative navigation Kalman Filter status word 2

BIT	DESIGNATION
0	LOGIC 1 = GRID OBSERVATION VALIDITY FAILURE (GVF)
1	LOGIC 1 = GEODETIC OBSERVATION VALIDITY FAILURE (GEF)
2	LOGIC 1 = NON-NAV SYNC OBSERVATION VALIDITY FAILURE
3-5	ORGANIZATIONAL USER TYPE (NAV)

BIT 5	4	3	
0	0	0	NOT USED
0	0	1	SECONDARY USER
0	1	0	PRIMARY USER
0	1	1	NAVIGATION CONTROLLER
1	0	0	SECONDARY NAVIGATION CONTROLLER
1	0	1	NOT USED
1	1	0	NOT USED
1	1	1	NOT USED

6	LOGIC 1 = POSITION REFERENCE (PR)
7	NOT USED
8-11	TRANSMITTED ALTITUDE QUALITY (Q_H)
12	R/S CIRCUMVENT LOGIC 1 = THE R/S IDENTIFIED IN BITS 13-15 IS BEING CIRCUMVENTED LOGIC 0 = NO R/S IS BEING CIRCUMVENTED
13-15	R/S CIRCUMVENT IDENTIFIER (R/S CID)

BITS	
000	RECEIVER SYNTHESIZER 1
001	RECEIVER SYNTHESIZER 2
010	RECEIVER SYNTHESIZER 3
011	RECEIVER SYNTHESIZER 4
100	RECEIVER SYNTHESIZER 5
101	RECEIVER SYNTHESIZER 6
110	RECEIVER SYNTHESIZER 7
111	RECEIVER SYNTHESIZER 8

5,3 DTB

WORD 34	R/T BIT word 1	(SEE 10.1.1.2.1.6)
WORD 35	R/T BIT word 2	(SEE 10.1.1.2.1.6)
WORD 36	R/T BIT word 3	(SEE 10.1.1.2.1.6)
WORD 37	R/T BIT word 4	(SEE 10.1.1.2.1.6)
WORD 38	PTP BIT word 1	(SEE 10.1.1.2.1.7)
WORD 39	PTP BIT word 2	(SEE 10.1.1.2.1.7)
WORD 40	CTP BIT word 1	(SEE 10.1.1.2.1.8)
WORD 41	CTP BIT word 2	(SEE 10.1.1.2.1.8)

10.1.1.3.1.7.5 SICP Status Report. The SICP Status Report DTB shall be as follows:

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	1	0	1	0	0	0	0	1	1	1	1
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
wd 2	TIME TAG															
wd 3														RI	TDF	
wd 4																
wd 5	NC	NCS TRACK NUMBER														
wd 6	AC					STAT			SN	VOICE A NET						
wd 7										VOICE A MSEC						
wd 8	SLS	PT	PACK			RATE			CD	MD	SSAEA					
wd 9	BC					STAT			SN	VOICE B NET						
wd 10										VOICE B MSEC						
wd 11	SLS	PT	PACK			RATE			CD	MD	SSAEB					
wd 12	CC					STAT			SN	CONTROL NET						
wd 13										CONTROL MSEC						
wd 14							RFAB	RFAA	HPAF		BIT	XRTT	CTPDS	R/T TST	DLT	

WORD 3 Host Interface Status

BIT	DESIGNATION
0	NOT USED
1	TACTICAL DATA SYSTEM FAILURE (TDF) LOGIC 0 = NO FAILURE LOGIC 1 = FAILURE

5,4 DTB

"

WORD 3 Host Interface Status (continued)

BIT	DESIGNATION
2	RELAY INHIBIT LOGIC 0 = DO NOT INHIBIT LOGIC 1 = INHIBIT
3-15	NOT USED

WORD 4 NOT USED

WORD 5 NCS IDENTIFICATION

BIT	DESIGNATION
0-14	NCS TRACK NUMBER 0 - NOT UNDER NCS CONTROL 1-32767 - TRACK NUMBER, AS SPECIFIED IN THE TADIL J TIDP, OF THE NET CONTROL STATION
15	NCS CHANGE 0 - NCS TN HAS NOT CHANGED 1 - NCS TN HAS CHANGED. NICP IS INSTRUCTED TO MARK ALL SLOT ASSIGNMENTS VULNERABLE.

WORD 6 Voice A channel Status

BIT	DESIGNATION
0-6	VOICE A CHANNEL NET NUMBER 0-126 = SELECTED NET FOR VOICE A CHANNEL 127 = CHANNEL IS DEACTIVATED
7	SPECIAL NET(SN) LOGIC 0 = NORMAL NET LOGIC 1 = SPECIAL NET

5,4 DTB

BIT	DESIGNATION
8-10	CHANNEL STATUS (STAT)

BIT 10	9	8	
0	0	0	OPERATIONAL
0	0	1	NET SELECTED SHUTDOWN
0	1	0	BIT-DETECTED FAULT
0	1	1	NO STATEMENT
1	0	0	SLOT ASSIGNMENT(S) NOT COMPATIBLE WITH VOICE SELECTION
1	0	1	INSUFFICIENT SLOTS DUE TO PACK
1	1	0	NOT USED
1	1	1	NOT USED

11-14	NOT USED
15	VOICE A CHANNEL CHANGE LOGIC 0 = NET, CHANNEL STATUS, MSEC, AND SUPPRESSION HAVE NOT CHANGED. LOGIC 1 = NET, CHANNEL STATUS, SUPPRESSION, OR MSEC HAS CHANGED.

WORD 7 Voice A MSEC Label

BIT	DESIGNATION
0-6	MSEC CRYPTOVARIABLE LABEL 0 = USE THE MSEC LOGICAL LABEL PROVIDED IN THE SLOT NOTE: THIS VALUE IS VALID IF THE SN VARIABLE IN WORD 1 - 127 MSEC LOGICAL LABEL
7-15	NOT USED

WORD 8 Voice A Suppression

BIT	DESIGNATION
0-5	VOICE A SUPPRESSED SLOT ASSIGNMENT NUMBER 0 - 63 TIME SLOT BLOCK POINTER.
6	SUPPRESSION MODULUS (MD) LOGIC 0 = SUPPRESSION MODULUS OF 3 LOGIC 1 = SUPPRESSION MODULUS OF 6
7	CODING (CD) LOGIC 0 = UNCODED LOGIC 1 = CODED (NOT USED BY NAVY)

5,4 DTB

WORD 8 Voice A Suppression (continued)

BIT	DESIGNATION
8-9	CHANNEL RATE

BIT 9	8	
0	0	16 KBPS
0	1	2.4 KBPS (NOT USED BY NAVY)
1	0	NOT USED
1	1	NO STATEMENT

10-11 NOT USED

12-13 PACKING LIMIT

BIT 13	12	
0	0	STANDARD
0	1	PACKED-2 DP
1	0	PACKED-2 SP
1	1	PACKED-4

14 PORT (PT)
LOGIC 0 = VOICE PORT 1
LOGIC 1 = VOICE PORT 2

15 SLOT SUPPRESSION (SLS)
LOGIC 0 = SUPPRESSION NOT REQUIRED (NOT USED BY NAVY)
LOGIC 1 = SUPPRESSION REQUIRED

WORD 9 Voice B Channel Status

Coding as for Word 6.

WORD 10 Voice B MSEC Label

Coding as for Word 7.

WORD 11 Voice B Suppression

Coding as for Word 8.

WORD 12 Control Channel Status

Coding as for Word 6 as applicable.

WORD 13 Control MSEC Label

Coding as for Word 7.

5,4 DTB

WORD 14 BIT Control Data

BIT	DESIGNATION
0	LOGIC 1 = START DIGITAL LOOPBACK TEST (DLT) (SRA ONLY)
1	LOGIC 1 = START R/T TEST MODE (R/T TST)
2	LOGIC 1 = CTP INTO DATA SILENT MODE (CTPDS) (SRA ONLY)
3	LOGIC 1 = START TRANSMIT RTT TEST MODE (XRTT)
4-5	BIT COMMAND

BIT 5	4	
0	0	NORMAL
0	1	WRA BIT COMMAND
1	0	SRA BIT COMMAND
1	1	ILLEGAL

6	NOT USED
7	HPA FAIL (HPAF) LOGIC 1 = HPA FAILURE LOGIC 0 = NO HPA FAILURE

NOTE: This bit is used to inform the NICP that the HPA has failed and to command the NICP to request HPA fault data over the TDMA tuning bus.

8	LOGIC 1 = START RFA A TEST
9	LOGIC 1 = START RFA B TEST
10-15	NOT USED

5,4 DTB

10.1.1.3.1.8 NICP Kalman Filter Data.

10.1.1.3.1.8.1 Synchronization Filter Data. The Synchronization Filter Data DTB shall be generated at the end of a Kalman Filter (either REL NAV or Oscillator Tracking) interval, and shall be as follows:

	MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0
wd 0	0	1	0	0	0	1	1	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
wd 2	TIME TAG															
wd 3	RTT SOURCE TN															
wd 4						ARR	BRR	EUR	BQT				AQT			
wd 5-6	RTT REPLY FAILURE CLOCK PHASE SHIFT															
wd 7-8	SYNC STATE VECTOR (ELEMENT 1)															
wd 9-10	SYNC STATE VECTOR (ELEMENT 2)															
wd 11-12	SYNC STATE VECTOR (ELEMENT 3)															
wd 13-14	SYNC STATE VECTOR (ELEMENT 4)															
wd 15-16	SYNC COVARIANCE 1															
wd 17-18	SYNC COVARIANCE 2															
wd 19-20	SYNC COVARIANCE 3															
wd 21-22	SYNC COVARIANCE 4															
wd 23	OTF DATA VALIDITY TIME															
wd 24	ETR STATUS								OVF	OSQT				EO	BRO	ARO
wd 25	RTT REPLY SOURCE TN															
wd 26-27	RTT INTERROGATION TOA															
wd 28-29	RTT REPLY TOA/ETR TOA															
wd 30	SYNC OBSERVATION TIME															
wd 31-32	SYNC OBSERVATION RESIDUAL															
wd 33-34	ETR TOA															
wd 35	ETR TIME TAG															

7,1 DTB

WORD 3 RTT Source Management Status (word 1)

BIT	DESIGNATION
0-15	RTT SOURCE TN

DEFINITION: Primary addressed RTT source TN as defined by RTT source management. A value of zero indicates no primary addressed RTT source exists.

WORD 4 RTT Source Management Status (word 2)

BIT	DESIGNATION
0-3	RTT ADDRESSED SOURCE TIME QUALITY (AQT)

DEFINITION: Primary addressed RTT source time quality as defined by RTT source management. A value of zero indicates no primary addressed RTT source exits.

4-7	RTT BROADCAST SOURCE TIME QUALITY (BQT)

DEFINITION: Primary Broadcast RTT source time quality as defined by RTT source management. A value of zero indicates no primary broadcast RTT source exists.

8	LOGIC 1 = ETR SYNC UPDATE REQUEST (EUR)
9	LOGIC 1 = BROADCAST RTT REQUEST (BRR)
10	LOGIC 1 = ADDRESSED RTT REQUEST (ARR)
11-15	NOT USED

WORDS 5-6 RTT Reply Failure Clock Phase ShiftREAL

UNITS: Nanoseconds
DEFINITION: Last clock phase shift commanded by RTT source management after RTT reply failures.

7,1 DTB

WORDS 7-14 Sync State Vector Elements REAL

DEFINITION: Four State Vector Elements of the OTF State Vector
UNITS: B_C-Clock Bias (Nanoseconds)
UNITS: f_C-Constant Frequency Offset (ns/s)
UNITS: f_{DO}-Dynamic Frequency Offset (ns/s)
UNITS: f_{DR}-Dynamic Frequency Rate of Change (ns/s squared)

WORDS 15-22 Sync Covariance Diagonal Elements REAL

DEFINITION: Four Covariance Diagonal Elements of the OTF corresponding to the four Sync State Vector Elements.

WORD 23 OTF Data Validity Time INTEGER

UNITS: Slot Counts
DEFINITION: Time at which the state vector is valid.

When terminal is operating in active synchronization this time is also the covariance validity time. When terminal is operating in passive synchronization the covariance validity is referenced to the covariance validity time identified in the 7/2 filter DTB.

WORD 24 Sync Observation data INTEGER

BIT	DESIGNATION
0	LOGIC 1 = ADDRESSED RTT OBSERVATION PROCESSED (ARO)
1	LOGIC 1 = BROADCAST RTT OBSERVATION PROCESSED (BRO)
2	LOGIC 1 = ETR OBSERVATION PROCESSED (EO)
3-6	OBSERVATION SOURCE TIME QUALITY (OSQT)
7	LOGIC 1 = SYNC OBSERVATION VALIDITY FAILURE (OVF)
8-11	NOT USED

7,1 DTB

WORD 24 (CONTINUED)

BIT	DESIGNATION
12-15	ETR STATUS

BIT 15	14	13	12	
0	0	0	0	NO STATEMENT
0	0	0	1	ETR UPDATE IS AVAILABLE FROM THE PTP
0	0	1	0	ETR BIT IS SET IN INITIALIZATION DATA
0	0	1	1	NO CLOCK CORRECTIONS ARE PENDING
0	1	0	0	ETR DATA DTB IS AVAILABLE FROM THE SICP
0	1	0	1	ETR DATA DTB IS WITHIN 1 SECOND OF THE ETR UPDATE
0	1	1	0	PHASE REFERENCE UNCERTAINTY IN THE ETR DATA DTB IS GREATER THAN 0.0 NSEC SQUARED
0	1	1	1	TRANSIENT STATE
1	0	0	0	PHASE REFERENCE UNCERTAINTY PASSES THE THRESHOLD TEST
1	0	0	1	ETR OBSERVATION RESIDUAL IS LESS THAN 1.25 SLOTS; ETR OBSERVATION IS PROCESSED
1	0	1	0	NOT USED
.	.	.	.	
1	1	1	1	NOT USED

WORD 25 RTT Reply Source TN

7,1 DTB

WORDS 26-27 RTT Interrogation TOA REAL

UNITS: Nanoseconds
DEFINITION: TOA of the RTT Interrogation as measured by the RTT source TOA is referenced to the end of symbol 72 (936 microseconds)

WORDS 28-29 RTT Reply TOA/ETR TOA REAL

UNITS: Nanoseconds
DEFINITION: For RTT, the RTT reply TOA is the TOA of the RTT reply as measured by the terminal. TOA is referenced to the first symbol.

For ETR, the ETR TOA, along with the sync observation time, represents the time of receipt of the ETR pulse as measured by the terminal. The sync observation time provides the slot portion of this time, and the ETR TOA provides the intraslot portion.

WORD 30 Sync Observation time

UNITS: Slot Counts
DEFINITION: For RTT, the slot in which the RTT is transmitted. For ETR, see ETR TOA

WORDS 31-32 Sync Observation Residual REAL

UNITS: Nanoseconds
DEFINITION: Kalman Filter Observation Residual

WORDS 33-34 ETR TOA REAL

UNITS: Nanoseconds
DEFINITION: Intraslot portion of the time of receipt of the ETR pulse as provided by the SICP in the ETR data (2/4) DTB.

WORD 35 ETR Time Tag INTEGER

UNITS: Slot Counts
DEFINITION: Time tag of the slot in which the NICP first processes the ETR pulse.

10.1.1.3.1.8.2 REL NAV Kalman Filter State Vector & Covariance Diagonal. The REL NAV Kalman Filter State Vector and Covariance Diagonal DTB shall be generated at the end of a Kalman Filter interval, and shall be as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	1	1	1	WC							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
wd 2	TIME TAG															
wds 3-4	REL NAV KALMAN COVARIANCE (ELEMENT 1)															
. .	. .															
wds 13-14	REL NAV KALMAN COVARIANCE (ELEMENT 6)															
wds 15-16	REL NAV KALMAN COVARIANCE (ELEMENT 8)															
. .	. .															
wds 33-34	REL NAV KALMAN COVARIANCE (ELEMENT 17)															
wd 35	COVARIANCE VALIDITY TIME															
wd 36	STATE VECTOR VALIDITY TIME 1															
wd 37	STATE VECTOR VALIDITY TIME 2															
wds 38-39	REL NAV KALMAN STATE (ELEMENT 1)															
. .	. .															
wds 48-49	REL NAV KALMAN STATE (ELEMENT 6)															
wds 50-51	REL NAV KALMAN STATE (ELEMENT 8)															
. .	. .															
wds 68-69	REL NAV KALMAN STATE (ELEMENT 17)															
wds 70-71	ESTIMATED GRID ORIGIN LATITUDE															
wds 72-73	ESTIMATED GRID ORIGIN LONGITUDE															
wds 74-75	Q3 NAV STATE															
wds 76-77	VERTICAL VELOCITY															
wd 78	AGRDM				RNEGDL	CNC	PR	NAV					PD	STYPE		

7,2 DTB

WORDS 3-34 REL NAV Kalman Filter Covariance REAL

DEFINITION: Diagonal elements of the relative navigation Kalman Filter Covariance Matrix. The indicated element number corresponds to the filter rows and columns of the Matrix, as specified in Tables I-II through I-V. The units are those of the indicated states and are all coded as real. Covariance elements 7, 18, 19, and 20 are stored in words 15-22 of synchronization filter data DTB.

WORD 35 Covariance Validity Time

UNITS: Slot Count
DEFINITION: The time at which the Kalman Filter Covariance Matrix is valid.

WORD 36 State Vector Validity Time 1

UNITS: Slot Count
DEFINITION: The time at which the navigation state vector is valid.

WORD 37 State Vector Validity Time 2

RANGE: -32768 to +32767
LSB: 7.8125 X 10**-6
UNITS: Seconds
REPRESENTED RANGE: ±256 Milliseconds
DEFINITION: Time of validity of state vector with respect to the slot interrupt at the beginning of the time tag slot.

WORDS 38-69 REL NAV Kalman State

DEFINITION: State Vector elements of the navigation function (NAV plus RNKF Corrections) corresponding to the Kalman Filter State Elements. The indicated element number corresponds to the filter state positions as specified in Tables I-II through I-V. The units are those of the indicated states, and are all coded as real, except for element 6, (Words 48-49), which are coded as 32-bit BAM. State elements 7, 18, 19 and 20 are stored in words 7-14 of Synchronization Filter Data DTB.

WORDS 70-71 Estimated Grid Origin Latitude BAM

DEFINITION: Kalman Filter estimate of Grid Origin Latitude

WORDS 72-73 Estimated Grid Origin Longitude BAM

DEFINITION: Kalman Filter estimate of Grid Origin Longitude

7,2 DTB

WORDS 74-75 Q3 NAV State REAL

DEFINITION: The Geographic quaternion representation of position. (quaternion element three)

WORDS 76-77 Vertical Velocity REAL

UNITS: FEET/SECOND
DEFINITION: D/R-SUPPLIED GEODETIC Z VELOCITY

WORD 78 KALMAN FILTER STATE

BIT	DESIGNATION
0-2	SYSTEM TYPE (STYPE)

CODING	DEFINITION
0	INERTIAL
1	NON-INERTIAL
2	TOA-ONLY (NO D/R)
3-7	NOT USED

3	PLATFORM DEFINITION (PD) LOGIC 0 = MOBILE LOGIC 1 = FIXED POINT
4-6	ORGANIZATIONAL USER TYPE (NAV)

CODING	DEFINITION
0	NOT USED
1	SECONDARY USER
2	PRIMARY USER
3	NAVIGATION CONTROLLER
4	SECONDARY NAVIGATION CONTROLLER
5-7	NOT USED

7	POSITION REFERENCE (PR) LOGIC 1 = POSITION REFERENCE LOGIC 0 = NOT A POSITION REFERENCE
8	COMMUNITY NAVIGATION CONTROLLER (CNC) LOGIC 1 = GROUND POINT LOGIC 0 = MOBILE
9-10	NEGATIVE PROPAGATION REPORTING (RNEGDL) RESERVED FOR INTERNAL NICP USAGE
11	NOT USED

7,2 DTB

WORD 78 KALMAN FILTER STATE (continued)

12-15 ADAPTIVE GRID DRIFT MODEL (AGRDM)

BIT 15	14	13	12	
0	0	0	0	PNC AND SNC NOT OBSERVED, OR TERMINAL IS PNC (DEFAULT DYNAMIC MODEL: MOBILE-LOW MODEL)
0	0	0	1	FIXED GROUND POINT PNC/SNC
0	0	1	0	STATIONARY PNC/SNC; MOBILE-LOW DYNAMIC MODEL
0	0	1	1	SINGLE MOBILE PNC, OR LOW DYNAMIC PNC/SNC; ADAPTIVE MODEL BASED ON PNC'S Q_P, MOBILE-LOW DYNAMIC MODEL.
0	1	0	0	HIGH DYNAMIC PNC AND SNC; MOBILE-HIGH DYNAMIC MODEL.
0	1	0	1	NOT USED
.	.	.	.	NOT USED
1	1	1	1	NOT USED

7,2 DTB

TABLE I-II. REL NAV FILTER

STATE NUMBER	CASE I INERTIAL D/R	CASE II NON-INERTIAL D/R	CASE III NO D/R (TOA ONLY)
1	$\in P_u$	$\in P_u$	$\in P_u$
2	$\in P_v$	$\in P_v$	$\in P_v$
3	$\in Q_1$	$\in Q_1$	$\in Q_1$
4	$\in Q_2$	$\in Q_2$	$\in Q_2$
5	$\in h$	$\in h$	$\in h$
6	Θ_{ZC}	Θ_{ZC}	Θ_{ZC}
7	B_C	B_C	B_C
8	$\in \Theta_Z$	$\in \Theta_{AZ}$	$\in A_Z$†
9	$\in V_x$	$\in V_{wx}$	$\in V_N$
10	$\in V_y$	$\in V_{wy}$	$\in V_w$
11	$\in \Theta_x$	$\in D_z$	$\in A_X$†
12	$\in \Theta_y$	$\in K_v$	$\in A_Y$†
13	$\in K_h$	$\in K_h$	$\in V_z$
14	$\in V_{BX}$	-	-
15	$\in V_{BY}$	-	-
16	$\in V_{uc}$	$\in V_{uc}$	$\in V_{uc}$
17	$\in V_{vc}$	$\in V_{vc}$	$\in V_{vc}$
18	$\in f_c$	$\in f_c$	$\in f_c$
19	$\in f_{DO}$	$\in f_{DO}$	$\in f_{DO}$
20	$\in f_{DR}$	$\in f_{DR}$	$\in f_{DR}$

† 3 STATE TOA-ONLY MOBILE MODE OF NAVIGATION

7,2 DTB

TABLE I-III. CASE I - INERTIAL D/R NAV KALMAN FILTER STATE VECTOR

STATE NUMBER	STATE	DEFINITION
1	$\in P_u$	GRID POSITION ERROR
2	$\in P_v$	
3	$\in Q_1$	ERROR QUATERNION REPRESENTATION FOR GEODETIC POSITION ERROR
4	$\in Q_2$	
5	$\in h$	ALTITUDE ERROR
6	Θ_{ZC}	GRID DRIFT AZIMUTH
7	B_C	CLOCK BIAS
8	$\in \Theta_Z$	PLATFORM AZIMUTH ERROR
9	V_x	GEODETIC VELOCITY ERROR
10	V_y	
11	$\in \Theta_x$	PLATFORM MISALIGNMENT
12	$\in \Theta_y$	
13	$\in K_h$	ALTITUDE SCALE FACTOR
14	$\in V_{BX}$	VELOCITY DAMPING ERROR
15	$\in V_{BY}$	
16	$\in V_{uc}$	GRID DRIFT VELOCITY ERROR
17	$\in V_{vc}$	
18	$\in f_C$	CONSTANT FREQUENCY OFFSET ERROR
19	$\in f_{DO}$	DYNAMIC FREQUENCY OFFSET ERROR
20	$\in f_{DR}$	DYNAMIC FREQUENCY RATE OF CHANGE ERROR

7,2 DTB

TABLE I-IV. CASE II - NON-INERTIAL D/R NAV KALMAN FILTER STATE VECTOR

STATE NUMBER	STATE	DEFINITION
1	$\in P_u$	GRID POSITION ERROR
2	$\in P_v$	
3	$\in Q_1$	ERROR QUATERNION REPRESENTATION FOR GEODETIC POSITION ERROR
4	$\in Q_2$	
5	$\in h$	ALTITUDE ERROR
6	Θ_{ZC}	GRID DRIFT AZIMUTH
7	B_C	CLOCK BIAS
8	$\in \Theta_{AZ}$	PLATFORM AZIMUTH ERROR
9	$\in V_{wn}$	WIND OR WATER VELOCITY ERRORS
10	$\in V_{ww}$	
11	$\in D_z$	AZIMUTH DRIFT ERROR
12	$\in K_v$	VELOCITY SCALE FACTOR
13	$\in K_h$	ALTITUDE SCALE FACTOR
14	-	-
15	-	-
16	$\in V_{uc}$	GRID DRIFT VELOCITY ERROR
17	$\in V_{vc}$	
18	$\in f_c$	CONSTANT FREQUENCY OFFSET ERROR
19	$\in f_{DO}$	DYNAMIC FREQUENCY OFFSET ERROR
20	$\in f_{DR}$	DYNAMIC FREQUENCY RATE OF CHANGE ERROR

7,2 DTB

TABLE I-V. CASE III - NO D/R (TOA ONLY) NAV KALMAN FILTER STATE VECTOR

STATE NUMBER	STATE	DEFINITION
1	$\in P_u$	GRID POSITION ERROR
2	$\in P_v$	
3	$\in Q_1$	ERROR QUARTERNION REPRESENTATION FOR GEODETIC POSITION ERROR
4	$\in Q_2$	
5	$\in h$	ALTITUDE ERROR
6	Θ_{ZC}	GRID DRIFT AZIMUTH
7	B_C	CLOCK BIAS
8	-	-
9	$\in V_N$	NORTH AND WEST VELOCITY ERRORS
10	$\in V_W$	
11	-	-
12	-	-
13	$\in V_Z$	Z VELOCITY ERROR
14	-	-
15	-	-
16	$\in V_{uc}$	GRID DRIFT VELOCITY ERROR
17	$\in V_{vc}$	
18	$\in f_C$	CONSTANT FREQUENCY OFFSET ERROR
19	$\in f_{DO}$	DYNAMIC FREQUENCY OFFSET ERROR
20	$\in f_{DR}$	DYNAMIC FREQUENCY RATE OF CHANGE ERROR

7,2 DTB

10.1.1.3.1.8.3 REL NAV Kalman Filter Observation Data. The REL NAV Kalman Filter Observation Data DTB shall be generated at the end of a Kalman Filter interval, and shall be as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 0	0	1	0	0	0	1	1	1	WORD COUNT							
wd 1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
wd 2	TIME TAG															
wd 3-8	NAV OBSERVATION TIME															
wd 9	NOT 4				NOT 3				NOT 2				NOT 1			
wd 10	OI	SSD	OF 6	OF 5	OF 4	OF 3	OF 2	OF 1	NOT 6				NOT 5			
wd 11-22	NAV OBSERVATION RANK															
wd 23-34	NAV OBSERVATION PSEUDO-RANGE															
wd 35-40	OBSERVATION SOURCE TRACK NUMBER															
wd 41-76	NAV OBSERVATION RESIDUALS															
wd 77	CBUF							RB	TB	GB	GEOBP			GRDBP		
wd 78	KALMAN BOUNDARY TIME															

The bit designation shall be as follows:

WORDS 3-8 NAV Observation Time
UNITS: Slot Counts
DEFINITION: Slot time at which the observation is valid. Representation is one time for each NAV observation.

WORD 9 NAV Observation Type

BIT	DESIGNATION
0-3	NAV OBSERVATION TYPE FOR OBSERVATION 1 (NOT 1)

CODING	DEFINITION
0	NO OBSERVATION PRESENT
1	HORIZONTAL GEODETIC POSITION FIX
2	TOA GEODETIC
3	OFFSET GEODETIC
4	HORIZONTAL AND VERTICAL POSITION FIX
5	CLOCK BIAS INITIALIZATION
6	NON-NAV TIME OBSERVATION
7	COARSE GRID ACQUISITION
8	TOA GRID
9	OFFSET GRID
10	HORIZONTAL VELOCITY BOUNDING OBSERVATION
11-15	NOT USED

7,4 DTB ˝

BIT	DESIGNATION

4-7 NAV OBSERVATION TYPE FOR OBSERVATION 2 (NOT 2)

CODING	DEFINITION
0	NO OBSERVATION PRESENT
1	HORIZONTAL GEODETIC POSITION FIX
2	TOA GEODETIC
3	OFFSET GEODETIC
4	HORIZONTAL AND VERTICAL POSITION FIX
5	CLOCK BIAS INITIALIZATION
6	NON-NAV TIME OBSERVATION
7	COARSE GRID ACQUISITION
8	TOA GRID
9	OFFSET GRID
10	HORIZONTAL VELOCITY BOUNDING OBSERVATION
11-15	NOT USED

8-11 NAV OBSERVATION TYPE FOR OBSERVATION 3 (NOT 3)

CODING	DEFINITION
0	NO OBSERVATION PRESENT
1	HORIZONTAL GEODETIC POSITION FIX
2	TOA GEODETIC
3	OFFSET GEODETIC
4	HORIZONTAL AND VERTICAL POSITION FIX
5	CLOCK BIAS INITIALIZATION
6	NON-NAV TIME OBSERVATION
7	COARSE GRID ACQUISITION
8	TOA GRID
9	OFFSET GRID
10	HORIZONTAL VELOCITY BOUNDING OBSERVATION
11-15	NOT USED

12-15 NAV OBSERVATION TYPE FOR OBSERVATION 4 (NOT 4)

CODING	DEFINITION
0	NO OBSERVATION PRESENT
1	HORIZONTAL GEODETIC POSITION FIX
2	TOA GEODETIC
3	OFFSET GEODETIC
4	HORIZONTAL AND VERTICAL POSITION FIX
5	CLOCK BIAS INITIALIZATION
6	NON-NAV TIME OBSERVATION
7	COARSE GRID ACQUISITION
8	TOA GRID
9	OFFSET GRID
10	HORIZONTAL VELOCITY BOUNDING OBSERVATION
11-15	NOT USED

7,4 DTB

WORD 10 Observation Data

BIT	DESIGNATION

0-3 NAV OBSERVATION TYPE FOR OBSERVATION 5 (NOT 5)

CODING	DEFINITION
0	NO OBSERVATION PRESENT
1	HORIZONTAL GEODETIC POSITION FIX
2	TOA GEODETIC
3	OFFSET GEODETIC
4	HORIZONTAL AND VERTICAL POSITION FIX
5	CLOCK BIAS INITIALIZATION
6	NON-NAV TIME OBSERVATION
7	COARSE GRID ACQUISITION
8	TOA GRID
9	OFFSET GRID
10	HORIZONTAL VELOCITY BOUNDING OBSERVATION
11-15	NOT USED

4-7 NAV OBSERVATION TYPE FOR OBSERVATION 6 (NOT 6)

CODING	DEFINITION
0	NO OBSERVATION PRESENT
1	HORIZONTAL GEODETIC POSITION FIX
2	TOA GEODETIC
3	OFFSET GEODETIC
4	HORIZONTAL AND VERTICAL POSITION FIX
5	CLOCK BIAS INITIALIZATION
6	NON-NAV TIME OBSERVATION
7	COARSE GRID ACQUISITION
8	TOA GRID
9	OFFSET GRID
10	HORIZONTAL VELOCITY BOUNDING OBSERVATION
11-15	NOT USED

8-13 NAV OBSERVATION FAILURE 1 THROUGH 6 (OF1-OF6)

DEFINITION: A value of one identifies an observation validity failure for the indicated observation.

14 SOURCE SCREENING DISABLED (SSD)
LOGIC 0 = SOURCE SCREENING ENABLED
LOGIC 1 = SOURCE SCREENING DISABLED

7,4 DTB

BIT	DESIGNATION
15	OBSERVATION INHIBITOR (OI)
16	

CODING	DEFINITION
0	KALMAN FILTER IS PROCESSING ALL OBSERVATIONS INDICATED BY THE NAV OBSERVATION TYPE WORDS
1	KALMAN FILTER IS NOT PROCESSING ALL OBSERVATIONS INDICATED BY THE NAV OBSERVATION TYPE WORDS DUE TO TIME RESTRAINTS.

WORDS 11-22 NAV Observation Rank REAL

DEFINITION: Rank of the observation as indicated by REL NAV source selection. Rank of -1.0 indicates an altitude update. Represented is one rank for each NAV observation.

OBSERVATION TYPE 4:
BITS 0-15: HORIZONTAL SIGMA

BITS 16-31: ALTITUDE SIGMA

OR
IF THIS IS AN INTERNALLY GENERATED ALTITUDE-ONLY FIX
BITS 0-15: -3
BITS 16-31: VARIANCE BOUNDING (feet)

WORDS 23-34 NAV Observation Pseudo-Range REAL

UNITS: Nanoseconds (for observation types 2, 5, or 8); Feet (for observation type 7).

DEFINITION: Pseudo-range as computed from measured TOA.

FOR OBSERVATION TYPE 4: the value is

$\pm$ [altitude residual ratio (RR)]$^{1/2}$

where: RR= (measurement)^2/(measurement+variance)

WORDS 35-40 Observation Source Track Number INTEGER

For each NAV observation type 2, 5, 7, 8 or 9.

DEFINITION: Source track numbers (STN's) for observations 1 through 6 (NOT 1 - NOT 6).
A value of $FFFF_{16}$ is reported for observation types 1 and 6. A value of 0000_{16} indicates no source present.

FOR OBSERVATION TYPE 4: 4: the value is altitude residual.

7,4 DTB

WORDS 41-76 NAV Observation Residuals REAL

UNITS: Defined by observation identified.

DEFINITION: Kalman Filter residual for each observation. Represented are up to three residuals for each observation.

Note 1. Third residual field is defined as follows:

BITS 0-7: source disposition
BITS 8-15:

$\pm$ [altitude residual ratio (RR)]$^{1/2}$

where: RR= (measurement)^2/(measurement+variance)

BITS: 16-31: nav time tag

VALUE	DEFINITION
1.0	Validity Failure
2.0	Source Skipped (one range update)
3.0	Source time-of-validity $\leq$ Kalman boundary time
4.0	Source Nav time-of-validity $\leq$ Kalman boundary time
5.0	Source and Nav times of validity disagree by more than 200 slots
6.0	Time overload or filter has been requested to "Hurry up"
10.0	Coarse grid acquisition failure excess iterations
12.0	Coarse grid acquisition failure-acquired grid origin latitude differs from reference grid latitude by more than 1 degree
13.0	Coarse grid acquisition failure-acquired grid origin longitude differs from reference grid longitude by more than 2 degrees
21.0	First source processed by Kalman filter
22.0	Second source processed by Kalman filter
23.0	Third source processed by Kalman filter
24.0	Fourth source processed by Kalman filter
25.0	Fifth source processed by Kalman filter
26.0	Sixth source processed by Kalman filter

7,4 DTB

WORD 77 Source Selection Input Data REAL

BIT	DESIGNATION
0-2	GRID BUFFER PARTITIONING (GRDBP) DEFINITION: Desired number of grid observations.
3-5	GEODETIC BUFFER PARTITIONING (GEOBP) DEFINITION: Desired number of geo observations.
6-8	COVARIANCE BLOW UP BITS

BIT	ASSOCIATED DATA
6	GEODETIC COVARIANCE BLOW UP(GB)
7	TIME COVARIANCE BLOW UP(TB)
8	GRID COVARIANCE BLOW UP(RB)

CODING	MODE
0	NO BLOW UP
1	COVARIANCES HAVE BEEN BLOWN UP IN THE KALMAN CYCLE DUE TO EXCESSIVE AVERAGE RESIDUAL ELLIPSE VALUE

9-15 COVARIANCE BLOW UP FACTOR (CBUF)

VALUE	DEFINITION
0	NO BLOW UP
1-3	NOT USED
4-126	COVARIANCES HAVE BEEN BLOWN UP BY A FACTOR OF APPROXIMATELY (CBF/4) SQUARED
127	COVARIANCES HAVE BEEN BLOWN UP BY A FACTOR OF GREATER THAN 31.625 SQUARED

NOTE: THE COVARIANCES THAT ARE BLOWN UP CORRESPOND TO THE OBSERVATION TYPES IMPLIED BY BITS 6-8. IF MORE THAN ONE OF THESE BITS IS SET, THEN THE CBF CORRESPONDS TO THE LATEST BLOW UP.

WORD 78 Kalman Boundary Time

UNITS: Slot counts

DEFINITION: Time at which the REL NAV Kalman filter projects a Kalman Boundary

7,4 DTB

10.1.1.4 NICP Port-to-Port Data Transfer. The NICP shall utilize a Plain Text Bus Port-to-Port Data Transfer when communicating with the following devices on the PTB:

a. Chronometer

b. Reference Time Base

10.1.1.4.1 Chronometer Interface. The NICP/Chronometer Interface shall utilize six words for initializing and reading chronometer data. The NICP shall control the data transfer by means of read and/or write into the chronometer port addresses $1DF8_{16}$, $1DF9_{16}$, $1DFA_{16}$ and $1DFB_{16}$. The format of the six words that will be written or read via these four port addresses shall be as follows:

MSB LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
wd 1 1DF8 write				SECONDS						SLOTS						
wd 2 1DF9 write						HOURS					MINUTES					
wd 3 1DF8 read	OVI		OS	SECONDS						SLOTS						
wd 4 1DF9 read	DAYS					HOURS					MINUTES					
wd 5 1DFA write															CRE	RRE
wd 6 1DFB write																

NOTE: The left most box in each row contains the word number, the chronometer port address in$_{16}$ and the 'read/write' 'from/to' the chronometer.

During the testing of the NICP on the COMMANDS Test Station (PQT) the following Global Memory Address Locations shall be used for the listed chronometer port addresses:

CHRONOMETER PORT ADDRESS	GM ADDRESS
$1DF8_{16}$	0146_{16}
$1DF9_{16}$	0147_{16}
$1DFA_{16}$	0148_{16}
$1DFB_{16}$	0149_{16}

The bit designation shall be as follows:

WORD 1

BIT	DESIGNATION
0-6	CHRONOMETER SLOTS (BINARY) 0 - 127
7-12	CHRONOMETER SECONDS (BINARY) 0 - 59
13-15	NOT USED

WORD 2

BIT	DESIGNATION
0-5	CHRONOMETER MINUTES (BINARY) 0 - 59
6-10	CHRONOMETER HOURS (BINARY) 0 - 23
11-15	NOT USED

WORD 3

BIT	DESIGNATION
0-6	SAME AS WORD 1
7-12	SAME AS WORD 1
13	OSCILLATOR SELECT (OS) LOGIC 1 = 10 MHz OSC FROM RTB SELECTED LOGIC 0 = 16 kHz OSC FROM CHRONOMETER SELECTED
14	NOT USED
15	OVERFLOW INDICATOR (OVI) LOGIC 1 = OVERFLOW. SET AFTER 32nd DAY THIS BIT SHALL BE RESET BY CHRONOMETER WHEN $1DF9_{16}$ WRITE IS PERFORMED.

WORD 4

BIT	DESIGNATION
0-5	SAME AS WORD 2
6-10	SAME AS WORD 2
11-15	CHRONOMETER DAYS (BINARY) 0 - 31

WORD 5

THIS ADDRESS SHALL BE USED AS A COMMAND TO DIRECT THE CHRONOMETER TO SWITCH FROM THE 16 kHz CHRONOMETER OSCILLATOR TO THE 10 MHz CLOCK, FROM THE REFERENCE TIME BASE (RTB).

BIT	DESIGNATION
0	RTB RESET ENABLE (RRE) LOGIC 1 = ENABLES NEXT CHRONOMETER EOS TO RESET RTB SLOT TIMER (NOT SLOT COUNTER)
1	CHRONOMETER RESET ENABLE (CRE) LOGIC 1 = ENABLES NEXT RTB EOS TO RESET CHRONOMETER TIMER (NOT SLOT COUNTER)

WORD 6

THIS ADDRESS SHALL BE USED AS A COMMAND TO DIRECT THE CHRONOMETER TO SWITCH FROM THE 10 MHz CLOCK, FROM THE RTB TO THE 16 kHz CHRONOMETER OSCILLATOR.

10.1.1.4.1.1 Chronometer Controls. The control functions for the Chronometer are as follows:

MUX Control - Writing into address $1DFA_{16}$ sets the frequency select MUX to the 16 kHz developed from the Reference Time Base 10 MHz countdown. Writing into address $1DFB_{16}$ sets the frequency select MUX to the 16 kHz developed from the chronometer battery-supported oscillator.

Time Initialization - The Chronometer time can be initialized by writing the time data of words 1 and 2 into port address $1DF8_{16}$ followed by $1DF9_{16}$. The input data is latched in chronometer buffer registers and the actual update occurs after writing into $1DF9_{16}$. Writing into $1DF8_{16}$ (without $1DF9_{16}$) leaves the Chronometer in an unaltered state. Writing into address $1DF9_{16}$ (without $1DF8_{16}$) will properly alter the hours and minutes, with the seconds and slots modified to the residual contents of the chronometer input buffer. When $1DF9_{16}$ is addressed for a write, the elapsed days and the overflow are reset to zero.

Time Readout - The current contents of the Chronometer can be obtained by reading address $1DF8_{16}$ and $1DF9_{16}$ in either order or separately. The reads do not activate any other operations.

Reset Enable - The reset enable allows the next EOS to reset the timer (part of the time counter that counts modulo 7.8125 msec). That is, the Chronometer Reset Enable (CRE) allows the next RTB slot timer EOS to reset the chronometer timer and the RTB reset enable (RRE) allows the next chronometer timer EOS to reset the RTB slot timer.

10.1.1.4.1.2 Chronometer Operation. The Chronometer operation can be broken down into three basic intervals.

a. Power Up (prior to coarse sync).
b. NICP Sync Control (commencing with coarse sync).
c. Power Down.

10.1.1.4.1.2.1 Power Up. During the Power Up sequence, the NICP shall write into port address $1DFA_{16}$ with data = 0000_{16} to command the 16 kHz clock MUX to select the 16 kHz derived from the RTB 10 MHz countdown. The NICP must then write into port address $1DFA_{16}$ with data = 0001_{16} (RRE) to align the phase of the RTB slot with the Chronometer. The NICP may now read the Chronometer TOD by addressing port addresses $1DF8_{16}$ and $1DF9_{16}$. The read must occur within 6 ms starting 10 microseconds after RTB EOS. The Chronometer is now in a control state which need not be altered until coarse sync. When a BIT check is required to be performed on the 16 kHz chronometer oscillator, the NICP shall write into port address $1DFB_{16}$ with data = 0000_{16} to command the 16 kHz clock MUX to select the 16 kHz derived from the chronometer oscillator. To return the chronometer back to the 10 MHz clock from the RTB, the NICP shall write into Port Address $1DFA_{16}$ with data = 0000_{16}.

10.1.1.4.1.2.2 NICP Sync Control. Once coarse sync has been achieved or a fine sync adjustment has been made, the NICP may update the Chronometer to system time by writing data = 0002_{16} into port address $1DFA_{16}$ (CRE), writing slot/sec into port address $1DF8_{16}$ and writing min/hr into port address $1DF9_{16}$. The write sequence must be in the order $1DFA_{16}$, $1DF8_{16}$ and $1DF9_{16}$. The writes must be performed within the 6 ms window 10 microseconds after CRE. Port reads may occur between $1DFA_{16}$ and $1DF8_{16}$ or between $1DF8_{16}$ and $1DF9_{16}$ or after $1DF9_{16}$ but within the 6 ms window. Once the chronometer has been reinitialized, reads may be performed at any time within the window without the requirement for writes into $1DFA_{16}$, $1DF8_{16}$ or $1DF9_{16}$.

10.1.1.4.1.2.3 Power Down. The Chronometer accounts for the first 128 seconds of power down and switches the 16 kHz source to the auxiliary 16 kHz oscillator. The NICP, upon receipt of a power shutdown interrupt, shall time tag the event by reading the Chronometer and storing the time in the battery-supported portion of GM. When the system returns from a power drop-out, the NICP shall handle the Chronometer as a power up sequence. After reading the Chronometer at power up, the NICP shall check the state of the chronometer oscillator select Bit (chronometer word 3 - Bit 13). If the Oscillator Select bit is set to Logic 1 (10 MHz clock from RTB selected), the NICP shall maintain fine sync if it was in fine sync prior to the shutdown, otherwise the sync state is set to zero. If the Oscillator Select Bit is set to Logic 0 (16 kHz oscillator from chronometer selected), the NICP shall revert to the normal power up sequence.

10.1.1.4.2 Reference Time Base Interface.

Location 1FF0 and $1FF1_{16}$. Read GPS1 and GPS2 are data transfers from the RTB to the PTP under control of the PTP. This transfer is performed when the External Time Reference has sent data to the terminal in the slot. The data format of this data transfer is the same as shown in paragraph 10.1.1.2.1.2 locations 0064_{16} and 0065_{16}.

Location $1FF2_{16}$. The slot divider time tag is described in 60.1.1.3.1.3.1 and 70.1.1.3.1.3.1

Location $1FF3_{16}$. Net Entry. The PTP shall write the Net Entry data transfer just prior to end of slot. The data transfer shall inform the RTB hardware of the type of sync enable waveform required for the terminal. The commands are NTR, USER, RESET, and CONTINUE. The format of this data transfer is as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	PORT ADDRESS LOCATION $1FF3_{16}$
NET ENTRY																

BITS	DESIGNATION
0-7	RESERVED FOR INTERNAL PTP PRECESSING

15	14	13	12	11	10	9	8	
0	0	0	0	0	0	0	0	CONTINUE
0	0	1	0	0	0	0	0	NET TIME REFERENCE
0	1	0	0	0	0	0	0	RESET
1	0	0	0	0	0	0	0	USER

OTHER VALUES NOT USED

Location $1FF4_{16}$. The NICP shall command frequency corrections to the Reference Time Base by means of a port-to-port data write into address $1FF4_{16}$. The format of the frequency correction word shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	PORT ADDRESS LOCATION $1FF4_{16}$
				FREQUENCY CORRECTION												

During testing of the NICP on the COMMANDS Test Station (PQT) the Global Memory Address Location $014A_{16}$ shall be used in place of the listed port address $1FF4_{16}$.

The bit designation shall be as follows:

BIT	DESIGNATION
0-1	NOT USED
2-11	FREQUENCY CORRECTION

(LSB = 20 x 2^{-9} HERTZ = 0.0390625 HERTZ)

IN THE FOLLOWING FORMAT

FREQUENCY	11 (BIT PATTERN) 2
F NOM + 40 x 2^{-9} Hz	= 0 1 1 1 1 1 1 1 1 0
F NOM + 20 x 2^{-9} Hz	= 0 1 1 1 1 1 1 1 1 1
F NOMINAL	= 1 0 0 0 0 0 0 0 0 0
F NOM - 20 x 2^{-9} Hz	= 1 0 0 0 0 0 0 0 0 1
F NOM - 40 x 2^{-9} Hz	= 1 0 0 0 0 0 0 0 1 0

WHERE F NOMINAL = 80 MHz

RANGE: APPROXIMATELY ±20 HERTZ

12-15	NOT USED

Location $1FF5_{16}$. SPARE

Location $1FF6_{16}$. Load Slot Counter. The PTP shall use this port to port transfer, once a slot, to pass the slot set value in bits 5 and 6 of location 0042_{16} to the RTB hardware. The format of the data is shown in 10.1.1.1.1.3.1 location 0042_{16}.

Location $1FF7_{16}$. Load Time Correction Down Counter. The time correction down counter port to port transfer is performed if the time correction word in location $005E_{16}$ is not equal to zero. The format of this data is shown in 10.1.1.1.1.24 the same as that shown for location $005E_{16}$.

10.1.1.5 NICP/PTP/SICP Mailbox Test Words. The NICP shall provide four words in Global Memory which shall be used to detect a PTP, NICP or SICP failure. Two of these words shall be used by the PTP and NICP for failure detection. The remaining two words shall be used by the SICP and NICP. The format and address location of the four mailbox words shall be as follows:

MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0	ADDRESS LOCATION
								NICP-PTP MAILBOX WORD								$007B_{16}$ WORD 1
								PTP-NICP MAILBOX WORD								$007C_{16}$ WORD 2
NICP - SICP MAILBOX WORD																$007D_{16}$ WORD 3
SICP - NICP MAILBOX WORD																$007E_{16}$ WORD 4

The bit designation shall be as follows:

WORDS 1 AND 2 $007B_{16}$ AND $007C_{16}$

BIT	DESIGNATION
0-7	MAILBOX COUNT (0-255)
8-15	NOT USED

The PTP during its 5.6 ms routine shall read the PTP-NICP mailbox word in GM $007C_{16}$ and increment its value by one and write it back to location $007C_{16}$. The PTP shall then read the NICP-PTP mailbox word in location $007B_{16}$ and compare it to the incremented value derived from location $007C_{16}$. If both of these numbers are equal, the mailbox test has passed and the Mailbox Test bit in location $006D_{16}$ (10.1.1.2.1.7) shall be set to a logic 1. If the mailbox test fails for ten consecutive slots the Mailbox Test bit shall be set to fail (logic 0), and is reported in Status Block 8, Word 3, Bit 12 (40.5.8.1). The NICP runs a similar test during its end of slot processing. First the NICP routine reads both PTP-NICP mailbox word and the NICP-PTP mailbox word and checks if they are equal. If so, the test has passed and the NICP increments the NICP-PTP mailbox word and writes it back to GM location $007B_{16}$. If the test fails the NICP writes a 0001_{16} to location $007B_{16}$ and a 0000_{16} to location $007C_{16}$. The NICP shall indicate a PTP mailbox failure, and is reported in Status Block 8, Word 3, Bit 12 (40.5.8.1).

WORDS 3 AND 4 $007D_{16}$ AND $007E_{16}$

BIT	DESIGNATION
0-15	MAILBOX COUNT (0-65535)

The NICP starts the test by setting a value into $007D_{16}$. The SICP then sets the same value into $007E_{16}$. The SICP and NICP then constantly increment and monitor these words. If the two words are the same the test passes. If they are different, the test fails.

Upon a failure, the NICP writes to the SACP output buffer ($00DC-00FB_{16}$) and 00DB (80.1.3.3.2) with Bit 0 set to "1". The SICP upon a failure sets 007F (10.1.1.6) Bit 0, to "1", and Status Block 8 Word 3 (60.12.1) Bit 15, is set to "1".

10.1.1.6 SICP Mailbox Fail Word. The SICP Mailbox Fail Word shall be provided by the NICP to report a SICP Mailbox Failure. The format of the SICP Mailbox Fail Word shall be as follows:

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDRESS LOCATION $007F_{16}$
															MBF	

The bit designation shall be as follows:

BIT	DESIGNATION
0	SICP MAILBOX FAIL (MBF) LOGIC 1 = SICP MAILBOX FAIL
1-15	NOT USED

10.1.2 Plain Text Processor Interface. The PTP shall interface with the NICP via Global Memory. The PTP shall read a group of 35 NICP supplied housekeeping words every slot time. The details of this data transfer shall be as specified in 10.1.1.1. During every slot time the PTP shall write a group of 18 words into Global Memory for use by the NICP. The details of this data transfer shall be as specified in 10.1.1.2.

10.1.3 Special Test Interface.

10.1.3.1 Terminal Testing. Eleven (11) memory words shall be provided in Global Memory for use by an external test computer during terminal testing. The external test computer shall provide the ten (10) words residing at locations $014B_{16}$ through 0154_{16} for use by the NICP. The NICP shall provide the remaining word at location $007A_{16}$ for use by the external test computer.

10.1.3.1.1 External Test Computer Supplied Words. The external test computer shall provide the following ten (10) words in Global Memory which are used to control specific housekeeping words for test purposes. The NICP shall read the ATPFLG Word (Word 0) every slot time and if this word is non-zero, the NICP shall read the remaining nine (9) words. The words enable the user of the Terminal to exercise the ability to alter the transmit timing of the Terminal, the ability to test the Reed-Solomon decode processing and the ability to control the Round Trip Timing responses of the Terminal. The format and address locations of the ten (10) words shall be as follows:

MSB LSB 16.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	ADDR LOC.	WORD
ATPFLG																014B	0
							F2								F1	014C	1
						TRANSMIT TIME WORD 1										014D	2
								TRANSMIT TIME WORD 2								014E	3
	SOURCE TRACK NUMBER (MESSAGE)															014F	4
												MESSAGE TYPE				0150	5
															RTI	0151	6
							F4								F3	0152	7
												TIME QUALITY				0153	8
	SOURCE TRACK NUMBER (RTT-A)															0154	9

The bit designation shall be as follows:

WORD 0 $014B_{16}$

BIT	DESIGNATION
0-15	ATP FLAG WORD (ATPFLG) ZERO = NO ACTION REQUIRED NON-ZERO = READ REMAINING NINE (9) WORDS

WORD 1 $014C_{16}$

BIT	DESIGNATION
0	TRANSMIT TIME WORD REPLACEMENT FLAG (F1) (MOMENTARY) LOGIC 0 = NO ACTION REQUIRED LOGIC 1 = REPLACE TRANSMIT TIME WORDS 1 AND 2 (SEE 10.1.1.1.1.20 AND 10.1.1.1.1.21) WITH WORDS 2 AND 3. REPLACE SOURCE TRACK NUMBER (MESSAGE) (SEE 10.1.1.1.1.5) WITH WORD 4, AND RESET THIS BIT TO 0.
1-7	NOT USED
8	MESSAGE TYPE (HEADER OF MESSAGE) WORD (SEE 10.1.1.1.1.4) AND MESSAGE LENGTH REPLACEMENT FLAG (F2) LOGIC 0 = NO ACTION REQUIRED LOGIC 1 = REPLACE MESSAGE TYPE (HEADER OF MESSAGE) WORD WITH WORD 5 AND IF WORD 6 IS NON-ZERO, SET BIT 10 OF R/T WORD 1 (SEE 10.1.1.1.1.14) TO LOGIC ONE, OR IF WORD 6 IS ZERO, SET BIT 10 OF R/T WORD 1 TO LOGIC ZERO. RESET THIS BIT TO 0.
9-15	NOT USED

WORD 2 $014D_{16}$

BIT	DESIGNATION
0-10	TRANSMIT TIME WORD 1, R REPLACEMENT
11-15	NOT USED

"

WORD 3 $014E_{16}$

BIT	DESIGNATION
0-7	TRANSMIT TIME WORD 2, I REPLACEMENT
8-15	NOT USED

WORD 4 $014F_{16}$

BIT	DESIGNATION
0-14	SOURCE TRACK NUMBER (MESSAGE) REPLACEMENT
15	NOT USED

WORD 5 0150_{16}

BIT	DESIGNATION
0-3	MESSAGE TYPE (HEADER OF MESSAGE) WORD REPLACEMENT
4-15	NOT USED

WORD 6 0151_{16}

BIT	DESIGNATION
0	R/T WORD 1 (XML) INDICATOR (RTI)
1-15	NOT USED

WORD 7 0152_{16}

BIT	DESIGNATION
0	RTT-A/RTT-B USAGE FLAG (F3) LOGIC 0 = NO ACTION REQUIRED LOGIC 1 = USE WORD 8 IN PLACE OF Q_{TS} FIELD OF TIME QUALITY WORD (SEE 10.1.1.1.1.11) AND USE WORD 9 IN PLACE OF SOURCE TRACK NUMBER (RTT-A) (SEE 10.1.1.1.1.12). DO NOT RESET THIS BIT.
1-7	NOT USED
8	TRANSMIT TIME WORD REPLACEMENT FLAG (F4) (PERMANENT UNTIL CHANGED) LOGIC 0 = NO ACTION REQUIRED LOGIC 1 = REPLACE TRANSMIT TIME WORDS 1 AND 2 (SEE 10.1.1.1.1.20 AND 10.1.1.1.1.21) WITH WORDS 2 AND 3. DO NOT RESET THIS BIT.
9-15	NOT USED

"

WORD 8 0153_{16}

BIT	DESIGNATION
0-3	TIME QUALITY (Q_{TS}) REPLACEMENT
4-15	NOT USED

WORD 9 0154_{16}

BIT	DESIGNATION
0-14	SOURCE TRACK NUMBER (RTT-A) REPLACEMENT
15	NOT USED

10.1.3.1.2 NICP Supplied Word. The NICP shall provide the following word in Global Memory which shall be used by the external test computer during the transfer of DTB's from the NICP. The NICP DTB Word Count shall indicate the total number of words contained in the five (5) NICP to SICP DTB word transmission buffers specified in 10.1.1.3. The format for the NICP DTB Word Count Word shall be as follows:

MSB 15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LSB 0	ADDRESS LOCATION $007A_{16}$
NICP DTB WORD COUNT																

The bit designation shall be as follows:

BIT	DESIGNATION
0-15	Indicates the total number of words contained in the five (5) NICP DTB word transmission buffers. (RANGE 0-300)